

BYZANTINE MUSIC FORMULAE



St. Anthony's Greek Orthodox Monastery

BYZANTINE MUSIC FORMULÆ



Version 2.0

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4784 N. St. Joseph's Way
Florence, AZ 85232 USA
Tel. (520) 868-3188
Fax (520) 868-3088
e-mail: monastery@stanthonysmonastery.org
website: www.stanthonysmonastery.org

Cover graphic is taken from an 1815 Athonite manuscript depicting protopsaltes of the eighteenth century. From top left to right: Petros Byzantios, Daniel Protopsaltis, Ioannis of Trebizond, and Iakovos Protopsaltis.

This entire collection of formulae is available online at:
<http://www.stanthonysmonastery.org/music/Formula.html>



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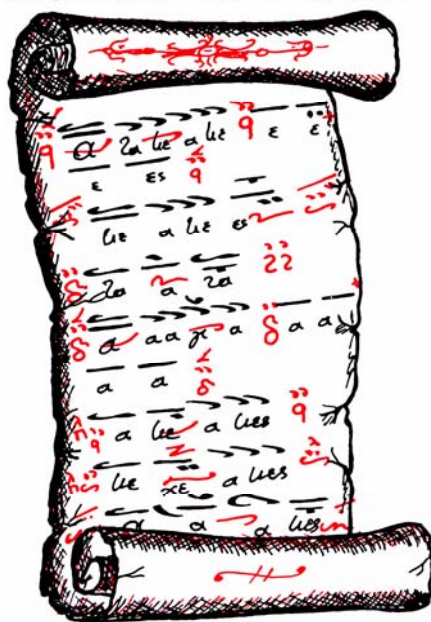
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Introduction



omposing Byzantine music in a traditional manner is a great challenge, because it requires not only inspiration, but also two technical prerequisites: 1) knowing which musical gestures or "formulae" are permitted for a particular syllabic pattern, and 2) knowing how to group these formulae together in a given mode. For as the musicologists Egon Wellesz and Gregorios Stathis have pointed out, "The task of a composer of Greek Orthodox church music has always been not to invent as many original melodies as possible, but to 'compose' a new melody from old and well-known formulae and cadences, or to write a variation on a given melody."¹ These formulae are a priceless treasure of Orthodox liturgical chant, because they were devised by hymnographers who over the centuries perfected the art of clothing liturgical texts with a melody that highlights their meaning in a way that aids prayer.

Unfortunately, the rules governing these formulae have never been codified thoroughly. As a result, composers who are only partially familiar with these rules frequently write music that departs from traditional melodic lines. This is a serious defect not only ideologically (in that such compositions can not be considered a valid continuation of the tradition of Orthodox chant—which, as the musicologist Dimitri Conomos has pointed out, is "the only music in world history that has a continuous 1500-year unbroken melodic tradition.") but also aesthetically, because—to quote Conomos again—"these age-old chants, especially preserved on Mount Athos, bear a relevance and a beauty that is unmatched by other, later productions." Besides, melodies that break these rules usually sound awkward even to the untrained ear due to a lack of balance between words and melody. This book presents these rules in an organized manner that facilitates traditional composition.

¹ 'An Introduction to Byzantine Music,' *Blackfriars*, 23 (1942), p. 377, as quoted by Gregory Stathis in *Studies in Eastern Chant*, Vol. IV, Miloš Velimirović, ed., St. Vladimir's Seminary Press, 1979, p. 192f.

This book contains more than 10,000 Byzantine music formulae. Because of the completeness of these lists, one may determine if a new composition breaks the formulaic rules by checking if its melodic phrases exist in these lists. One may also use these lists to compose a Byzantine melody for a liturgical text in any language. The "workshop" demonstrates how to use these lists in order to compose a melody for a sample liturgical text in English. By studying these lists, a chanter can quickly develop the invaluable skill of being able to invent on the spot a valid Byzantine melody in any mode for any text in any language.

Classification of Modes

Each of the eight modes can be subdivided into several categories based on the ratio of notes to syllables and on the tempo of a particular genre. Chrysanthos of Madytos, one of the three teachers, wrote that the "forms of psalmody belong to four melodic genera: the old sticheraric, the new sticheraric, papadic, and heirmologic."² Georgios Hatzitheodorou however,³ teaches that there are actually eight such subdivisions:

- 1) the concise, syllabic heirmologic melody (e.g., the brief version of the *katavasia* Χριστὸς Γεννᾶται)
- 2) the "new" concise sticheraric melody (e.g., the brief versions of Κύριε ἐκέκραξα found in back of the *Ἀναστασιματάριον*)
- 3) the slow heirmologic melody (e.g., the slow version of the *katavasia* Χριστὸς Γεννᾶται)
- 4) the "new" slow sticheraric melody (e.g., the slow versions of Κύριε ἐκέκραξα found in the *Ἀναστασιματάριον*)⁴ These melodies are considered "new" because they constitute a genre of music that was perfected in the eighteenth century.
- 5) the "old" sticheraric melody (e.g., the very slow version of the *doxasticon* Ἀναστάσεως ἡμέρα by Chrysaphes the New). These melodies are considered "old" because they were composed between the twelfth and sixteenth centuries.
- 6) the papadic melody (e.g., cherubic and communion hymns)⁵

² Χρυσάνθου τοῦ ἐκ Μαδυτῶν, *Εἰσαγωγή εἰς τὸ Θεωρητικὸν καὶ Πρακτικὸν τῆς Ἐκκλησιαστικῆς Μουσικῆς*, ἐν Παρισίοις, 1821, σελ. 179, §402.

³ Χατζηθεωδόρου, Γεώργιος Ι., *Θεωρητικὸν Βυζαντινῆς Μουσικῆς - Μέρος Δεύτερον - Θεωρητικόν*, Ἐκδόσεις «Πολυχρονάκης», Κρήτη, 2004, σελ. 68-70.

⁴ A further subdivision could be made for the more elaborate sticheraric melodies such as those found in the 11 *Eothina Doxastica* of the *Ἀναστασιματάριον* and in the *Ἀθωνιάδα* published by Petros Philanthidis in 1906.

⁵ Gregorios Stathis clarifies that there are two other forms of papadic melodies: the melody of the *Kontakion* (or *Oikematarion*) and the melody of the *Kratematarion* (e.g., the old *Anoixantaria*, verses of the *Polyeleos*, etc.) Vid. Στάθης Γρηγόριος, *Οἱ Ἀναγραμματισμοὶ καὶ τὰ Μαθήματα τῆς Βυζαντινῆς Μελopoιῆας*, Ἰδρυμα Βυζαντινῆς Μουσικολογίας, Μελέται 3, Ἀθήνα, 1979, σελ. 46.

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- 7) the kalophonic heirmologic melody (e.g., the very slow version of Λίθον ὃν ἀπεδοκίμασαν on p. 336 in volume IV of the series *Μουσικὸς Πανδέκτης*)
- 8) the ekphonic melody (e.g., the melodies used for intoning the gospel, epistle readings, and the petitions of the priest and deacon)

The vast majority of troparia chanted today are the heirmologic melodies that comprise subdivisions 1 and 2. The next most frequent kind of troparia in contemporary usage is the sticheraric melodies of subdivision 4. (See footnote 6 below for a list of these troparia.) Less frequently used are the papadic melodies in subdivision 6 and the slow herimological melodies in subdivision 3. The very slow melodies of subdivisions 5 and 7 are rarely chanted today. The

⁶ In contemporary Greek Orthodox practice, the following troparia are chanted with a sticheraric melody:

- 1) The Κύριε ἐκέκραξα (Lord, I have cried) of Vespers chanted every Saturday and every feast day.
- 2) The Ἑσπέρια and Ἀπόστιχα troparia chanted every Saturday—i.e., the troparia following "Lord, I have cried" and the troparia preceding Νῦν ἀπολύεις (the prayer of St. Symeon). Note that the *Ἀναστασιματάριον* (the book with music for the resurrectional hymns of the Octoechos) has two versions for each of these melodies: a sticheraric version and a heirmologic version. In current practice, the Aposticha are almost always chanted according to the heirmologic melody, whereas the Esperia are usually chanted according to the sticheraric melody.
- 3) The Saturday evening Doxasticon of the Esperia (also known as the first Dogmatikon Theotokion) and the Saturday evening Doxasticon of the Aposticha (also known as the second theotokion). Although the *Anastasimatarion* has heirmologic versions of the Dogmatikon Theotokion, in most places it is rarely used. On the contrary though, the second theotokion is almost always chanted heirmologically according to contemporary usage. According to some Athonite rubrics however, the sticheraric version of the second theotokion is chanted when it is not immediately preceded by a doxasticon.
- 4) The Πᾶσα Πνοὴ (Let every breath) of the Αἶνοι (the Praises), which is chanted near the end of Orthros every Sunday and every feast day. The *Anastasimatarion* does have heirmologic versions of this troparion as well, but those brief versions are used only in a weekday Orthros in which a major saint is not commemorated.
- 5) The resurrectional troparia for the Praises chanted every Sunday morning. Again, the *Anastasimatarion* provides both sticheraric and heirmologic versions of these troparia. In contemporary usage, the heirmologic versions are preferred, although practices vary. In some places on Mt. Athos, the sticheraric versions are chanted for first, second, plagal first, and plagal second modes, while the heirmologic versions are chanted for the remaining modes.
- 6) The eleven Eothina Doxastica.
- 7) The Esperia troparia of the Twelve Great Feasts, except for the feasts of the Entry of the Theotokos, the Annunciation, and the Dormition, in which the Esperia troparia are prosomoia (which can however be chanted in the slow heirmologic style).
- 8) The Aposticha troparia of the Twelve Great Feasts, except for the feasts of the Exaltation of the Cross, the Entry of the Theotokos, and the Meeting of our Lord.
- 9) The Doxasticon of the Esperia, Aposticha, and Praises for every saint's feast day that has such doxastica.
- 10) All troparia of the Liti except for the Theotokion of the Liti, which sometimes is heirmologic.
- 11) The idiomela of Orthros that are chanted on feast days after the fiftieth psalm.
- 12) Various troparia from the Divine Liturgy, such as the slow Trisagion, the slow Alleluias, and some versions of the Anaphora, *It is Truly Right*, Communion hymns, psalm verses, etc.

melodies of section 8 are usually intoned according to oral tradition rather than from written music.

Each of these subdivisions has its own rules of composition that determine which melodic gestures are permitted for a particular syllabic pattern. Our lists contain the musical formulae used in the heirmologic melodies of subdivisions 1 and 2, and the sticheraric melodies of subdivision 4. We chose to codify only these formulae since they cover the vast majority of troparia in current usage.⁷

Limitations of These Lists

One slight drawback of our lists of formulae is that they are not inclusive of every single possible melodic formula. Nevertheless, they do include 100% of all commonly used formulae and at least 90% of the less common formulae. In the rare event that no formula or combination of formulae in our lists provides a satisfactory solution, a chanter with moderate experience should be able without difficulty to combine his knowledge with these lists in order to find an acceptable solution.

Another limitation of these lists is that they were compiled only from Byzantine music in Greek. There is a considerable amount of Byzantine music written in Slavonic, Romanian, Arabic, and more recently also in Western European languages including English, French, and Spanish. However, most of these compositions are merely adaptations of original Greek melodies, and some of them depart considerably from the style of the original. Therefore, we considered them to be secondary sources and excluded them from our compilation. Even though we have relied solely on Greek sources of Byzantine music, our experience has shown that our lists of formulae contain more than enough variety necessary for composing new melodies in English. To see many compositions made by relying on our lists of formulae, see our Vespers book at: <http://www.stanthonysmonastery.org/music/Vespers.htm>

Sticheraric melodies (i.e., the "new, slow sticheraric melodies" of subdivision 4 consist of two kinds of formulae: formulae that are purely sticheraric and formulae that are heirmologic. The purely sticheraric formulae have two or more syllables in them that are held for more than one beat, whereas the heirmologic formulae have at most one syllable that lasts for two beats. These heirmologic formulae are also named "bridges" or "fillers" since they are used to connect two sticheraric formulae. There are hundreds of possible bridges allowable for each mode. We have not included a list of all such bridges in the sticheraric lists of formulae, since the building

⁷ Dr. Jessica Suchy-Pilalis has also compiled a list of heirmologic formulae in Western notation, but her work is unpublished.

Introduction

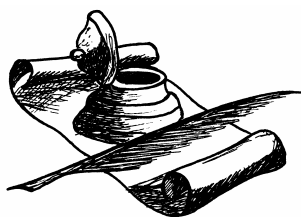
blocks to construct such a bridge are found in the heirmologic lists. Nevertheless, we have included a sampling to serve as a reminder of what bridges are common for that particular mode .

Another minor drawback of these lists is that they do not delineate which patterns of formulae are acceptable. For example, a sticheraric melody in third mode frequently begins with a phrase ending on KE, followed by a cadence on PA, and then two consecutive cadences on KE, etc. It is expected that the composer will already have a general notion of these melodic movements and will be able choose formulae accordingly. It is also expected of the composer to know when to select a formula from the section entitled "Fthoras" in order to color a certain word or phrase according to its meaning.

One other aspect that is left to the composer's discretion is the choice of how many notes to use per syllable on average. An astute observer will notice that based on this ratio of notes to syllables, one can classify sticheraric melodies into three sub-categories:

- 1) sticheraric melodies for idiomela,
- 2) sticheraric melodies for doxastica, and
- 3) sticheraric melodies for doxastica of special feast days.

Melodies for idiomela will typically have a smaller ratio of notes to syllables than melodies for doxastica do. Composers accomplished this by inserting between the sticheraric formulae heirmologic bridges more frequently. They would also accomplish this by increasing the length of these bridges. Some sticheraric compositions can be found with such bridges consisting of as many as eighteen consecutive syllables, each having a single note. On the other side of the spectrum, the doxastica of special feast days tend to have more notes per syllable than the doxastica of regular days, because composers would make their melodies more elaborate by using some of the lengthy "old" sticheraric formulae (which we have included in a separate section in each list of formulae).





Workshop: *How to Compose Byzantine Music Using the Lists of Formulae*

The following pages comprise a little "workshop" that demonstrates how to use the lists of Byzantine music formulae* to compose the melody for a sticheraric hymn in first mode.

We will take a hymn from the *Festal Menaion* in first mode. On page 137 in the Lity of the Universal Exaltation of the Cross (Sept. 14) is the following hymn (which was not translated into English using any particular meter):

"Prefiguring Thy Cross, O Christ, Jacob the Patriarch, when he gave the blessing to his descendants, laid his hands crosswise upon their heads. And today as we exalt Thy Cross, O Saviour, we cry: Give victory to Thine Orthodox people[,] as Thou once gavest it to Constantine."

The first step is to break down the hymn into binary code, where "1" is an accented syllable and "0" is an unaccented syllable, while preserving the punctuation:

010001, 01, 100100, 00101000010, 101100101. 001000101, 010, 01: 01000010010, 0001000100.

Notice that after the word "people" a comma was added even though the original text did not have a comma there. This was done in order to separate that long sentence ("Give victory to Thine Orthodox people as Thou once gavest it to Constantine") into two smaller pieces. The comma was added in a place in the sentence where one would naturally pause when reading it out loud.

The next step is to break the hymn into smaller phrases:

* These lists are available online at: <http://www.stanthonysmonastery.org/music/Formula.html>

010001, 01,
100100,
00101000010,
101100101.
001000101,
010, 01:
01000010010,
0001000100.

Notice that wherever there was a punctuation mark in the original text, a line break has been inserted, so that the composition can be tackled piece-by-piece. The two brief phrases "O Christ" and "we cry" were not put on separate lines, since they are too brief. Instead, they were attached to the previous phrases, because this is how the words would be grouped if one were to read them out loud.

For easier reference, I will number each of the phrases in this hymn as follows:

- 1) 010001, 01,
- 2) 100100,
- 3) 00101000010,
- 4) 101100101.
- 5) 001000101,
- 6) 010, 01:
- 7) 01000010010,
- 8) 0001000100.

Phrase #1 begins with a four-syllable word "prefiguring" which has the pattern: 0100. Since most sticheraric troparia in first mode start with a musical phrase that has a cadence on PA, we should look for a match to this pattern in section C (on p. 36). There are seven matches to this pattern: six for 0100 and two for 010X. There are also five formulas with the pattern 100, which can also be used by simply inserting a filler note before them. Any of these will do fine, but since the melody found in the first instance of 100 is a common way to begin a troparion, let's select that one and insert an ison before it as a filler note.

IMPORTANT COMMENT #1:

The primary attribute of a phrase that determines its melody is the pattern of accents found in its last syllables. Therefore, a composer can use "filler notes" at the beginning of a formula given here in order to create a melody for a phrase that has more syllables than provided in the formula

The rest of this phrase has a syllabic pattern 0101. Typically troparia in this mode stay around PA in the beginning, so let's find another formula ending on PA. The third entry on page 37 section C (XXX1) matches our pattern. So if we use it, the melody we have so far is as follows:

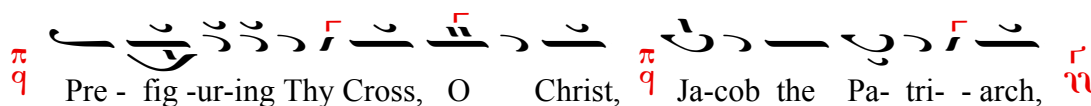


The next phrase (#2) should be grouped together with phrase #3 due to the meaning of their words. Therefore, phrase #2 should not end of Pa (which is used for first mode cadences associated with a period in the lyrics) but on Ga, which is a medial cadence for first mode. So we will look for something that matches the binary code 100100 in section G, since this is the section with melodies ending on Ga that are accented on the third to last syllable. Although there isn't an entry for 100100, there are several for 100, 10X, 0100, and 010X, all of which can be applied for our phrase, simply by adding filler notes before them. If we choose the third formula given for 0100, the pattern for our filler notes will be 10 (for the word "Jacob"). Instead of just adding two isons for filler notes, it would be better to use filler notes that would emphasize the first syllable of "Jacob." These "filler notes" may also be called "heirmologic bridges" because they consist of syllabic melodies (i.e. melodies with one note per syllable) similar to heirmologic melodies. They are called "bridges" because they are used to join the sticheraric formulas of a hymn.

IMPORTANT COMMENT #2:

When composing a melody for a heirmologic bridge, accentuated syllables are usually written with a psefistón, a petastē, or as an oligon followed by an ison.

According to the rules of Byzantine music orthography,^{*} in melodies with one note per syllable, a petastē is used when followed by only one descending note, whereas a psefistón is used when followed by two or more descending notes. Bearing this in mind, we can use a petastē followed by an apóstrophos for the two syllables of the word "Jacob." Afterwards, in order to end up at the right pitch for the formula of 0100 we chose, the petastē will have to be a jump of three. So adding all this, we now have:



^{*} We have compiled more than 100 of these rules and have posted them at:
<http://www.stanthonysmonastery.org/music/ByzOrthography.pdf> (25 pages, 260 Kb)

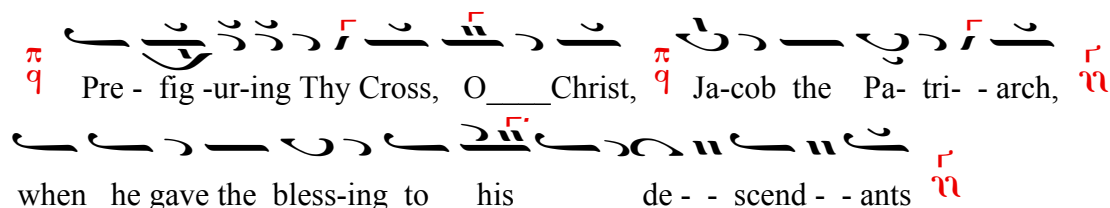
In order to choose a melody for the next phrase (#3), we must first decide if it should end on Ga or Pa. Since the next phrase (#4) ends with a period, we know that we will have to end on Pa then. So to avoid ending on Pa twice in a row, let's end phrase #3 on Ga. Since the last word in phrase #3 is accented on the second to last syllable, we will have to use a formula from section F. Another option would be to use a formula from section I (since this also has cadences on Ga). Because all melodies in section F go to high Nee, they are usually reserved for words that have something to do with spatial or spiritual height. But the words for our phrase are "when he gave the blessing to his descendants," which has nothing particularly lofty about it. So we will use a formula from section F.

Although section F doesn't have a formula that suits our needs exactly (remember, we're looking for something to match "00101000010") there is a formula for the pattern X010. This is good enough, since as we said (in "Important Comment #1") all that really matters is the final few syllables of a phrase. All we need to do now is to add some filler notes at the beginning to cover the first seven syllables of this phrase. Although this might seem quite a large number of syllables to use as a herimologic bridge, it really isn't.

IMPORTANT COMMENT #3:

If we examine the sticheraric melodies found in *Mousike Kypsele* for troparia of the Lity, we will find that sometimes more than a dozen consecutive syllables are given one note each.

To create a melody for these seven syllables, it is necessary to know what the dominant notes are in the mode at hand. In sticheraric first mode, Pa and Ga are the primary dominant notes. Since we are already at Ga, our syllabic melody should play around Ga. And as we stated in "Important Comment #2," we want to create a melody such that the accentuated syllables of the phrase will be a psefistón, a petastē, or an oligon followed by an ison. So following these guidelines, we can easily come up with a little melody, and then attach to it the X010 formula we chose, resulting in the following melody:



 Pre - fig - ur - ing Thy Cross, O Christ, Ja - cob the Pa - tri - - arch,

 when he gave the bless - ing to his de - - scend - - ants

As we already mentioned, we will want to end the next phrase (#4) on Pa since it ends with a period. Therefore, we will look in section A for a formula that will take us from Ga to Pa that matches our syllabic pattern: 101100101. Upon examining the formulas of this mode that lead the melody from Ga to Pa, we can see that there is a tremendous amount of freedom regarding placement of accentuated syllables, as witnessed by the

numerous "X's" in the binary code. As a result, we have several melodies to choose from. In particular, we could use the melodies for 100001, XX0X0XX, 1X0X0XX, 01X0X0XX, 1010000XX, 10010X, 0100100, or 00100100. I personally think that the melody of XX0X0XX on page 42 fits nicely, so let's use it. But since our syllabic pattern has two extra syllables in the front, we will have to invent a heirmologic bridge to fill the gap. Since our extra syllables have an accentuation pattern "10" (for the words "laid his") we can use an ison over a petastē for the accentuated syllable "laid," and then use an apóstrophos for the word "his." Then, to join this bridge we constructed with the 1X0X0XX we chose, it is necessary to change the first ison in this formula into an oligon.

IMPORTANT COMMENT #4: It is the absolute pitch of the first character in a formula that is important rather than its intervallic jump. For example, a formula beginning with a martyria of Ga and an ison can be used as a formula from Pa by replacing the ison with a jump up of two.

So pasting the words into this formula and adding it to what we already have, provides the following:

Pre - fig - ur-ing Thy_Cross, O___Christ, Ja - cob the Pa- tri- - arch,

 when he gave the bless-ing to his_____de - - scend - - ants laid his hands_

 _____ cross - - - wise up - - on their_____heads.

Notice that the syllable "on" of the word "upon" is an accentuated syllable, but it was placed in a formula that does not accentuate it.

IMPORTANT COMMENT #5: There is usually nothing wrong with putting an accented syllable in a place where the melodic formula would normally call for an unaccented syllable. However, doing the opposite is a mistake that sticks out like a sore thumb, i.e., placing an unaccented syllable in place where the melodic formula calls for an accented syllable.

To continue, the next phrase is: "And today as we exalt Thy Cross." Since words like "exalt," "heaven," etc., are frequently emphasized by using a melody that goes high, we can try to do this by using a formula from section I on page 53 that goes to high Nee for the word "exalt." The words "exalt Thy Cross" have the binary code 0100. So we can use the first formula in section I (which is 100) if we just add an ison before it. But in order to use this formula which begins on Ga, the previous words "And today as we" must take us from Pa to Ga. So looking in section G on page 48 for a formula that matches our syllabic pattern (00100), we see that there is none with this pattern. However, there are several with the pattern 0100. We can easily use one of these by simply inserting an ison at the beginning of it. The question is, which one should we choose? Notice that the first one is not a sticheraric formula but a heirmologic bridge (i.e., it has one beat per syllable). Since we are composing music for a troparion of the Lity (as opposed to some fancy doxastikon), we don't want it to be too lengthy. Therefore, we should be using heirmologic bridges whenever we have a choice. So we will use that heirmologic bridge, which gives us the following::

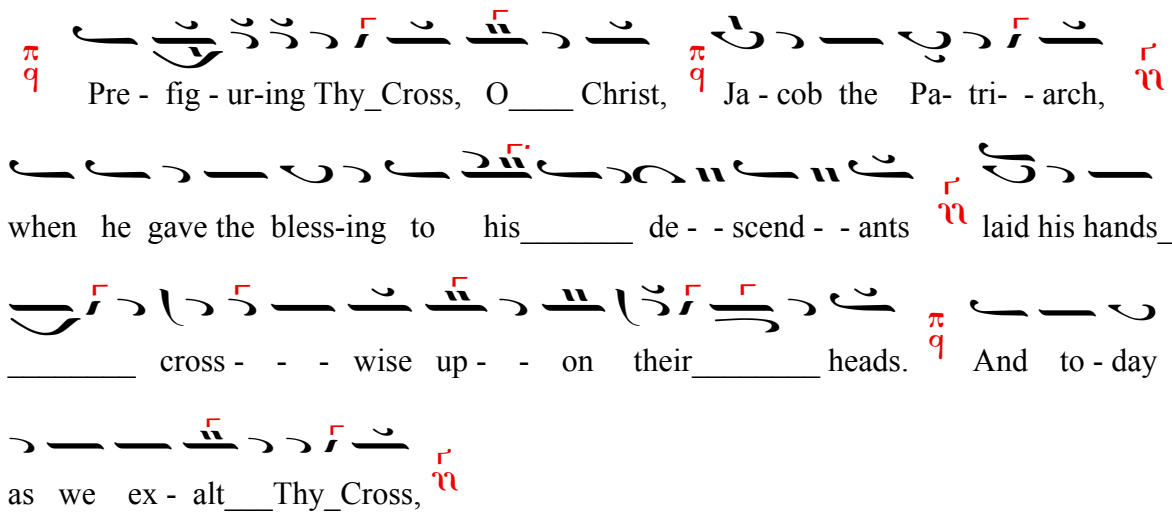
Pre - fig - ur-ing Thy_Cross, O___ Christ, Ja - cob the Pa- tri- - arch,

 when he gave the bless-ing to his_____ de - - scend - - ants laid his hands_____

 _____ cross - - - wise up - - on their_____ heads. And to - day

 as we ex - alt___Thy___ Cross,

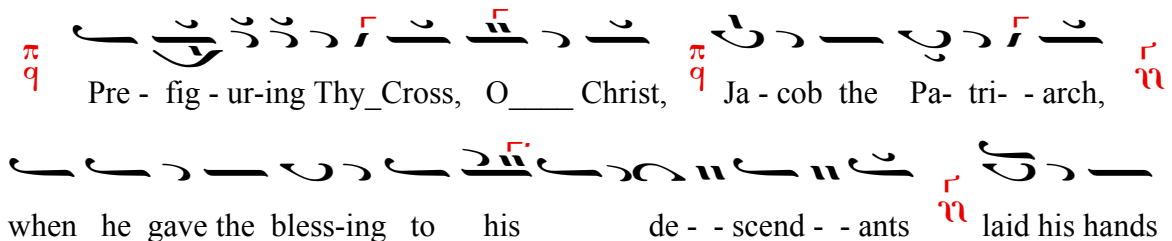
But now that we put those pieces together for that last phrase, those three isons in a row don't sound very elegant. So let's discard that idea for those last two pieces (for the words: "And today as we" and "exalt Thy Cross") and choose instead a formula from section G that goes directly from Pa to Ga. Although there is no formula that is a perfect match for our syllabic pattern (001000101), the last formula in the section of formulas accented on the third to last syllable (on page 49) has the code: 100100100010X. At first glance, these two codes appear quite different, but since it is the ending of each code that is most important, we can see that they will match perfectly if we merely delete the first four syllables of the formula and use minimal creativity to change the pitch of the fifth syllable from Ga to Pa so that the transition is smoother. So pasting the words into this formula gives us the following:

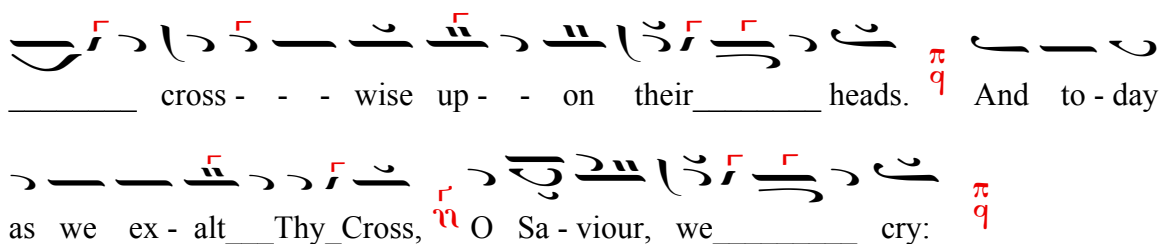


The next phrase ("O Sa-viour, we cry:") ends with a colon. This means that we don't want to end the phrase at Ga (which is only for temporary medial cadences) but at Pa. So we will look for a phrase that takes us from Ga to Pa that matches our code: 01001. Unfortunately, there is no formula in section D in the subsection with formulas from Ga to Pa (on page 42) that ends with 1001 (or even 1000, which would have sufficed). However, we can borrow a formula from the first part of section D that has formulas from Pa to Pa (on page 41), as long as we change a note or two in the beginning to make the transition smooth. The formula at the bottom of page 41 (010XX) is a perfect match to our code. But since its first note is a Pa, we can change it to a Vou so that there is not a sudden jump down of two from where we are. We are allowed to tinker with the initial Pa of this formula, because when a formula begins with an ison, that ison is usually superfluous.

IMPORTANT COMMENT #6: When a formula begins with an unaccented ison, that ison may be removed to create a new formula.

So plugging the text into this formula gives us:





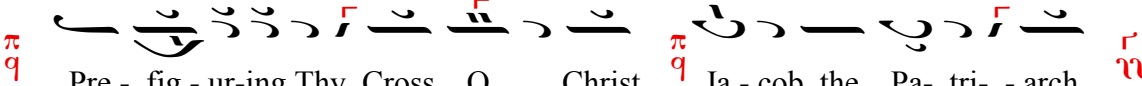


This worked just fine, except for one small detail: the rhythm is "trisemos" (in Western notation, this would be a measure with 3:4 time) between these last two formulas, i.e., from the word "Cross" to "Saviour." Although it is not unheard of to join sticheraric formulas in this manner, composers often avoid doing so.

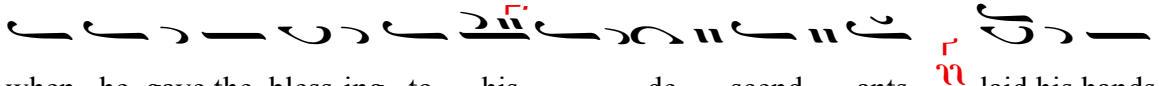

IMPORTANT COMMENT #7: In order to avoid a trisemos rhythm between formulas, either the klásma of the last character in the former formula is removed (or replaced by a diplē), or a gorgón is added to the first character in the latter formula.

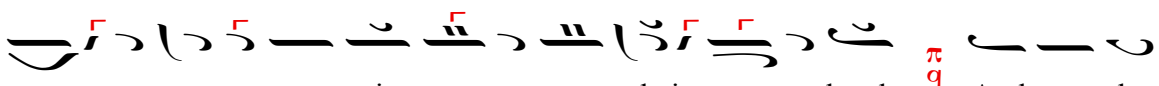

In our case, adding a gorgón to the apóstrophos would sound appropriate.

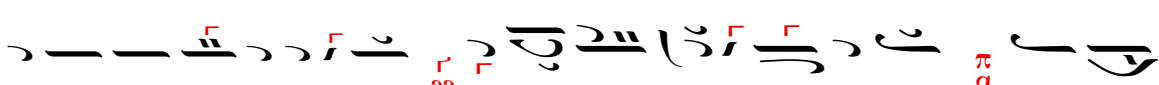


The next phrase (#7) could end either on Ga or Pa. Since sticheraric melodies in first mode frequently have two consecutive cadences on Pa, let's end this phrase on Pa again. So looking in section B for a match to our phrase (that has the binary code: 01000010010), we see that there four options for the syllabic pattern 010010. This is exactly what we need, since as we have said, the important thing is to match the final syllables of a phrase. I myself like the sound of the third option (at the bottom of page 32), so I will choose that one. The only problem is that these 010010 formulas don't have enough syllables in the beginning to match our 01000010010 phrase. So we can break up this phrase into two pieces, based on the meaning of the words in it. In particular, we can put the words "Give victory" in the first half, and "to Thine Orthodox people" in the second half. As we just said, the second half of the phrase (which has the pattern 0010010) is already taken care of by the melody we chose at the bottom of page 32 with the code 010010. Our extra unaccented syllable can be accounted for by simply attaching an ison to the beginning of that melodic formula. As for the first half of the phrase (which has the pattern 0100), we will look in section C, since we have a phrase accented on the third to last syllable that starts and ends on Pa. We see on page 36 that we have six formulas to choose from (not including the 100 and 010X formulas on this page which we could also use). The first two 0100 formulas are heirmologic bridges because they have one beat per syllable, while the other 0100 formulas have two or more syllables that are held for two beats. In this particular place in our troparion, we don't want a melody that has an ending that sounds like a final cadence, since the meaning of these words of our 0100 phrase ("Give victory") needs to bind seamlessly with the next phrase ("to

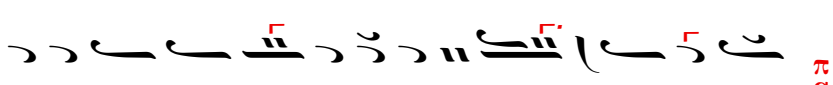

Thine Orthodox people"). And since this is just a simple troparion for the Lity, we want to use heirmologic bridges wherever possible. Therefore, the most appropriate of these 0100 formulas will be one of the first two, which are simple heirmologic bridges. So if we choose the first one and add these formulas to our hymn along with the words, we now have:


 Pre - fig - ur-ing Thy_Cross, O___ Christ,  Ja - cob the Pa- tri- - arch, 


 when he gave the bless-ing to his_____ de - - scend - - ants  laid his hands_


 _____ cross - - - wise up - - on their_____ heads.  And to - day


 as we ex - alt___Thy_Cross,  O Sa - viour, we_____ cry:  Give vic -


 to- ry to Thine Or - - tho-dox___ peo - - - - ple, 

Since there is a "trisemos" rhythm between the words "cry" and "victory," we could add a gorgon on "Give" or remove the klásma on "cry" in order to avoid this rhythm. However, doing so would make the break between the phrases "we cry" and "Give victory" less pronounced. This would be detrimental in this situation, because these phrases are separated not just by a comma (as there was between "Cross" and "O") but a colon, which denotes a separation between two independent clauses. Therefore, we should not diminish the break between these phrases, and so we will leave the trisemos rhythm as it is.

Now we have finished everything except for the last phrase. The final cadences of sticheraric first mode almost always ascend to Di before ending on Pa. That is why the list of formulas of this mode has two separate sections for final cadences: a section with melodies ending on Di, and a section for the final ending on Pa. So in order to match our pattern (0001000100), we will try to build a melody having this pattern by combining a formula that takes us from Pa to Dee (in section N) with a formula that takes us from Dee down to Pa (section O). Ideally, we should break our 0001000100 phrase into two pieces such that the resulting pieces are independent units, grammatically speaking. So it would make sense to make the first piece: "as Thou once gavest it" (000100) and the second piece: "to Constantine" (0100). However, the formulaic rules won't let us do this, because there are no semi-final cadences on Di that end with the pattern "100". There are two that

end with "101" (at the bottom of page 65) but using either of these will unduly emphasize the word "it". We can't break it up as "as Thou once gavest it to" (0001000) and "Constantine" (100) because there are no formulas in section O that have only three syllables to match our "100" phrase. So instead, we will have to break up the words as follows: "as Thou once gavest" (00010) and "it to Constantine" (00100).

Section N has only two melodies that match our syllabic pattern of 00010 (at the top of page 68). I don't particularly like either of them for our words, because they both seem to give too much emphasis on the word "gavest" by dragging out that accented syllable for four beats.

Another option is to use a formula from section M. Even though these are labelled as formulas with melodies from **Ga** to Di, while we want a formula with a melody from **Pa** to Di, we can still adapt it. As I mentioned in "Important Comment #4," all we need to do is to increase the intervallic jump of the first character by two, and then we are free to use it. So we can take the formula for 00010 in section M (on page 65), and change its first ison into a jump up of two, and it will work just fine.

And now to find a melody for the final four syllables of our troparion, we need to find a match for our pattern of 00100 in section O. So we could either use the formula for 0XX0X or any of the three for 001XX. Theoretically, any of these would be alright, but applying the formulas with a jump down of three would make the break between the words "gavest" and "it" too abrupt, so let's use the one that gradually descends with three apóstrophoses.

So now, we just need to add the ison and a nice-looking drop cap (available online at: <http://www.stanthonysmonastery.org/music/ByzDropCaps.zip>), and we have the final product (on the following page):



π
q

P re - fig - ur - ing Thy_Cross, O Christ, Ja - cob the Pa - tri - arch,

when he gave the bless - ing to his de - - scend - - ants laid his hands

cross - - - wise up - - on their heads. And to - day

as we ex - alt Thy_Cross, O Sa - viour, we cry: Give vic -

to - ry to Thine Or - - tho - dox peo - - - - ple, as Thou once gav -

est it to Con - - - - stan - - - - - tine.

Voilà! With a minor effort that required only minimal creativity, we were able to set this hymn nicely to Byzantine music. The following page is a transcription of this melody in Western notation.



PREFIGURING THY CROSS

Sticheraric
First Mode

Andante ♩=96

Pre - fig - ur - ing Thy Cross, O Christ,

Ja - cob the Pa - tri - arch, when he gave the bless - ing to his

de - scend - ants laid his hands cross - wise up - on their

heads. And to - day as we ex - alt Thy Cross, O Sa - viour,

we cry: Give vic - to - ry to Thine Or - tho - dox peo - ple,

as Thou once gav - est it to Con - stan - tine.



First Mode



BYZANTINE MUSIC FORMULAE

First Mode - Sticheraric

Contents*

<u>Medial Cadences on Pa</u>	
A) Accented on Last Syllable	27
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D) Accented on Fourth to Last Syllable	41
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G) Accented on Third to Last Syllable	48
H) Accented on Fourth to Last Syllable	51
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P) Final Cadence for Theotokia	70

* The Byzantine music formulae herein were extracted from sticheraric melodies found in the *Zoe Anastasimatarion* (14th edition, 2002), the three-volume set of *Mousike Kypsele* (1883 edition), the *Doxastarion* of Konstantinos Protopsaltis (1844 edition), and the *Athonias* (1906 edition) by Petros Philanthidis.

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

Medial Cadences on Pa

A) Accented on Last Syllable

Pa - Pa

0	$\pi_q \overline{\quad} \pi_q$ 0	
01	$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$ 0 1	
X001	$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$ X 0 0 1	$\overline{\quad}$ X
XXX1	$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$ X X X 1	
0XXX	$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$ 0 X X X	
01001	$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$ 0 1 0 0 1	
010XX	$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$ 0 1 0 X X	
10001	$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$ 1 0 0 0 1	
	$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$ 1 0 0 0 1	$\overline{\quad}$ 1 $\overline{\quad}$ 1 $\overline{\quad}$ 0
	$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$ 1 0 0 0 1	
	$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$ 1 0 0 0 1	$\overline{\quad}$ 1 $\overline{\quad}$ 0

First Mode - Sticheraric

X0XXX	π_q π_q X 0 X X X
010XXX	π_q π_q 0 1 0 X X X
10X0001	π_q π_q 1 0 X 0 0 0 1
00100010XX	π_q π_q 0 0 1 0 0 0 1 0 X X

Ga - Pa

The highlighted formulae may be accentuated either on the last or second to last syllable. However, these formulae are used only occasionally words accented on the last syllable. Since such instances sound as if the melody incorrectly accentuates the text, these instances have been highlighted in this section.

100001	π_q π_q 1 0 0 0 0 1
0100XX	π_q π_q 0 1 0 0 X X
010001	π_q π_q 0 1 0 0 0 1
001X0XX	π_q π_q 0 0 1 X 0 X X
0X0X0XX	π_q π_q 0 X 0 X 0 X X
XX0X0XX	π_q π_q X X 0 X 0 X X
1X0X0XX	π_q π_q π_q 1 X 0 X 0 X X 1

First Mode - Sticheraric

10X0X0XX	π_q
X0X0X0XX	π_q
01X0X0XX	π_q
1010000XX	π_q

B) Accented on Second to Last Syllable

Pa - Pa

10

$$\pi_q \xrightarrow{1} \pi_q$$
$$\pi_q \begin{array}{c} \text{---} \\ \text{---} \\ \text{---} \end{array} \begin{array}{c} \text{---} \\ \text{---} \\ \text{---} \end{array} \pi_q$$
$$\begin{array}{ccccc} \pi & \curvearrowright & & \curvearrowright & \pi \\ q & 1 & & 0 & q \end{array}$$
[illegible]

010

[illegible]
$$\pi_q \overbrace{\quad\quad}^0 \overbrace{\quad\quad}^1 \overbrace{\quad\quad}^0 \pi_q$$
$$\pi_q \text{ --- } \overset{0}{\text{---}} \overset{1}{\text{---}} \text{ --- } \pi_q$$
$$\pi_q \overbrace{\quad}^{\Gamma} \overbrace{\quad}^{\Gamma} \overbrace{\quad}^{\circ} \overbrace{\quad}^{\Gamma} \pi_q$$
$$\pi_q \quad \text{---} \quad \text{---} \quad \text{---} \quad \pi_q$$

1

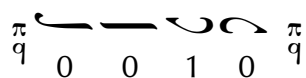
$$\pi_q \xrightarrow{0} \xrightarrow{1} \xrightarrow{0} \pi_q$$
[illegible]

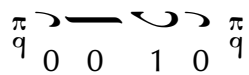
0010

$$\pi_q \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \pi_q$$

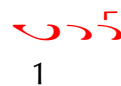
0 0 1 0

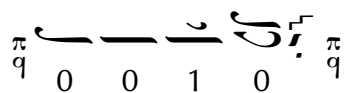
First Mode - Sticheraric

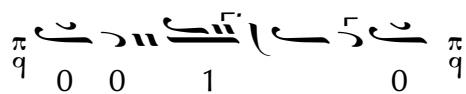
π_q  π_q
0 0 1 0

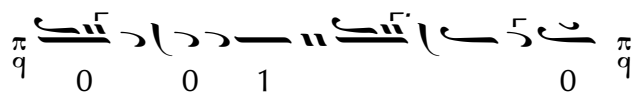
π_q  π_q
0 0 1 0

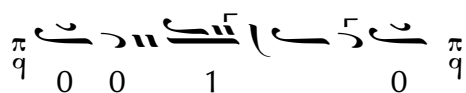
π_q  π_q
0 0 1 0


1

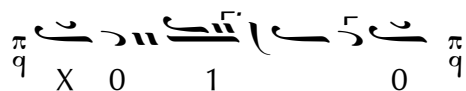
π_q  π_q
0 0 1 0

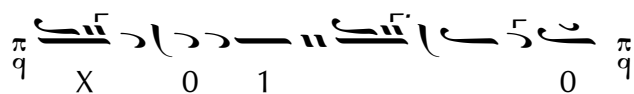
π_q  π_q
0 0 1 0

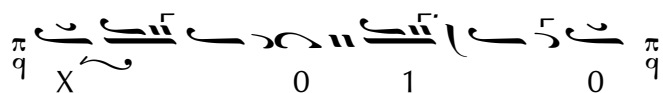
π_q  π_q
0 0 1 0

π_q  π_q
0 0 1 0

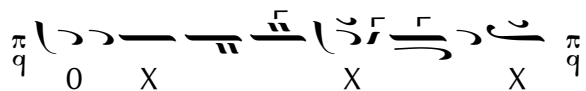
X010

π_q  π_q
X 0 1 0

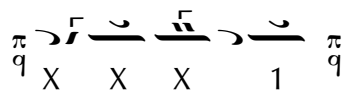
π_q  π_q
X 0 1 0

π_q  π_q
X 0 1 0

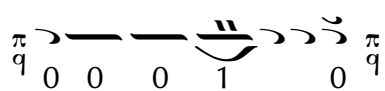
0XXX

π_q  π_q
0 X X X

XXX1

π_q  π_q
X X X 1

00010

π_q  π_q
0 0 0 1 0

First Mode - Sticheraric

π_q 0 0 0 1 0 π_q

π_q 0 0 1 0 0 π_q

10010

π_q 1 0 0 1 0 π_q

010XX

π_q 0 1 0 X X π_q

10XXX

π_q 1 0 X X X π_q

X0XXX

π_q X 0 X X X π_q

000010

π_q 0 0 0 0 1 0 π_q

00X010

π_q 0 0 X 0 1 0 π_q

010XXX

π_q 0 1 0 X X X π_q

010010

π_q 0 1 0 0 1 0 π_q

0 0

π_q 0 1 0 0 1 0 π_q

π_q 0 1 0 0 1 0 π_q

First Mode - Sticheraric

π_q π_q

100010

π_q π_q

0010100

π_q π_q

0101010

π_q π_q

1000010

π_q π_q

π_q π_q

π_q π_q

1010010

π_q π_q

X010010

π_q π_q

00010010

π_q π_q

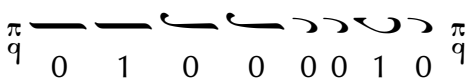
π_q π_q

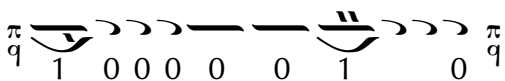
00100010

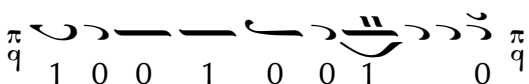
π_q π_q

1 0

First Mode - Sticheraric

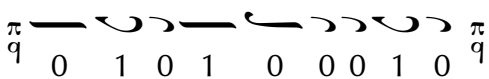
01000010 π_q 


10000010 π_q 

10010010 π_q 

010000010 π_q 

010010010 π_q 

010100010 π_q 

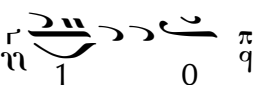
0010010010 π_q 

1010000010 π_q 

01010000010 π_q 

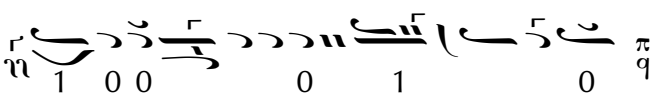
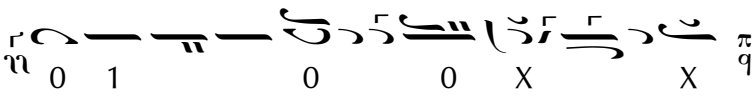
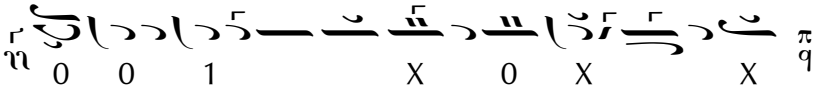
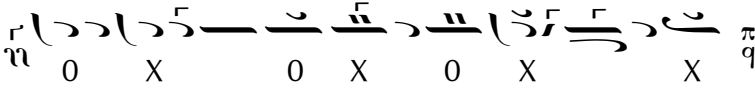
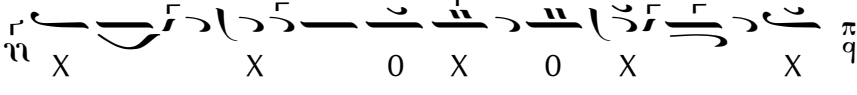
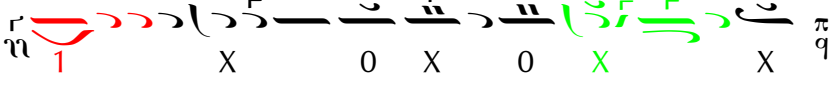


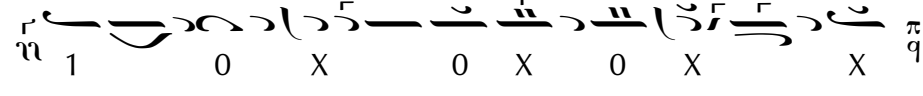
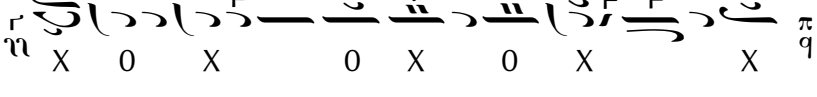
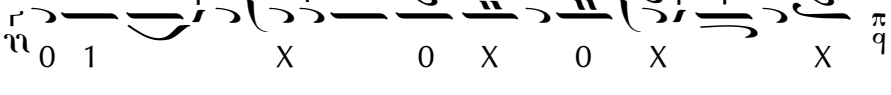
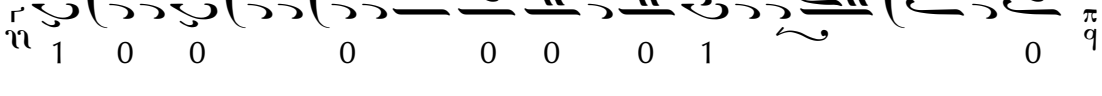
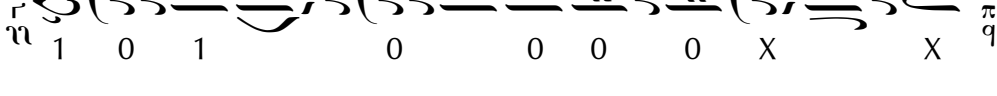
010001000010 π_q 

Ga - Pa

10 π_q 

010 π_q  

First Mode - Sticheraric

100010	
0100XX	
001X0XX	
0X0X0XX	
XX0X0XX	
1X0X0XX	  
10X0X0XX	
X0X0X0XX	
01X0X0XX	
100000010	
1010000XX	

C) Accented on Third to Last Syllable

Pa - Pa

100	$\pi_q \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$	$\overbrace{0}^{\sim}$
	$\pi_q \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$	
	$\pi_q \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$	
	$\pi_q \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$	
	$\pi_q \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$	
0100	$\pi_q \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$	$\pi_q \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$
	$\pi_q \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$	
	$\pi_q \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$	
	$\pi_q \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$	
	$\pi_q \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$	
	$\pi_q \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$	
010X	$\pi_q \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{X}^{\sim} \pi_q$	
	$\pi_q \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{X}^{\sim} \pi_q$	

First Mode - Sticheraric

$$\pi_q \begin{array}{ccccccc} \hookrightarrow & \hookrightarrow & \dashrightarrow & \xrightarrow{\pi} & \hookrightarrow & \xrightarrow{\pi} & \hookrightarrow \\ 0 & 1 & & X & & X & \end{array} \pi_q$$
$$\pi_q \circ \left(\begin{array}{c} \text{---} \\ \text{---} \\ \text{---} \end{array} \right) \circ \pi_q$$
$$\pi_q \circ \begin{array}{c} \curvearrowright \\ \hline X \end{array} \circ \begin{array}{c} \curvearrowright \\ \hline X \end{array} \circ \begin{array}{c} \curvearrowright \\ \hline X \end{array} \circ \begin{array}{c} \curvearrowright \\ \hline 1 \end{array} \circ \pi_q$$
$$\begin{array}{ccccccc} \pi_q & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \pi_q \\ & 0 & 0 & 1 & & 0 & 0 \end{array}$$
$$\begin{array}{ccccccccc} \pi_q & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \pi_q \\ & 0 & 0 & 1 & 0 & 0 & & \end{array}$$
$$\pi_q \begin{array}{c} \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \end{array} \begin{array}{c} \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \end{array} \begin{array}{c} \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \end{array} \begin{array}{c} \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \end{array} \begin{array}{c} \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \end{array} \pi_q$$
$$\overset{\pi_q}{\curvearrowright} \text{---} \text{---} \text{---} \underset{0}{\curvearrowright} \underset{0}{\curvearrowright} \underset{0}{\curvearrowright} \underset{1}{\curvearrowright} \text{---} \text{---} \text{---} \underset{0}{\curvearrowright} \text{---} \text{---} \text{---} \underset{0}{\curvearrowright} \overset{\pi_q}{\curvearrowright}$$
$$\begin{array}{ccccccc} \pi & & & & & & \pi \\ q & \curvearrowright & \text{---} & \text{---} & \text{---} & \text{---} & q \\ & 0 & 0 & 0 & 1 & 0 & 0 \end{array}$$
$$\pi_q \begin{array}{c} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \\ \text{0} \quad \text{0} \quad \text{0} \quad \text{1} \quad \text{0} \quad \text{0} \end{array} \pi_q$$
[illegible]
$$\pi_q \overline{\quad} \begin{array}{c} \text{---} \\ \text{---} \end{array} \begin{array}{c} \text{---} \\ \text{---} \end{array} \begin{array}{c} \text{---} \\ \text{---} \end{array} \begin{array}{c} \text{---} \\ \text{---} \end{array} \begin{array}{c} \text{---} \\ \text{---} \end{array} \pi_q$$
$$\pi_q \left(\begin{array}{ccccccc} \hookrightarrow & \xrightarrow{\quad} & \hookrightarrow & \hookrightarrow & \xrightarrow{\quad} & \hookrightarrow & \xrightarrow{\quad} \\ 0 & 0 & 0 & 1 & \xrightarrow{\quad} & X & \xrightarrow{\quad} \\ & & & & & & X \end{array} \right) \pi_q$$
$$\pi_q \begin{array}{ccccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 1 & 0 & X & & X & X \end{array} \pi_q$$

First Mode - Sticheraric

010100 π_q 0 1 0 1 π_q

0101XX π_q 0 1 0 1 X X π_q

100100 π_q 1 0 0 1 0 0 π_q

π_q 1 0 0 1 0 0 π_q

0100100 π_q 0 1 0 0 1 0 0 π_q

π_q 0 1 0 0 1 0 0 π_q

π_q 1 0 0 0 1 0 0

1000100 π_q 1 0 0 0 1 0 0 π_q

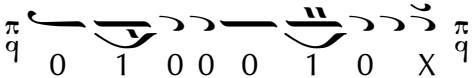
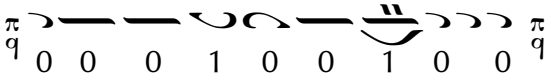
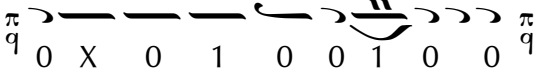
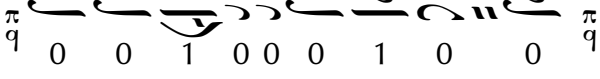
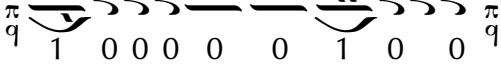
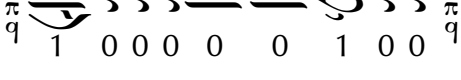
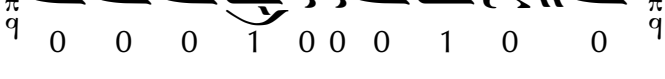
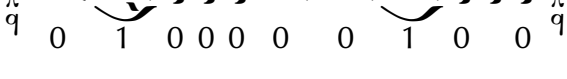
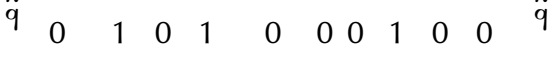
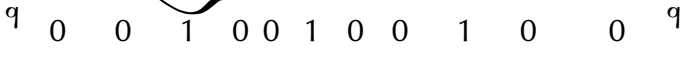
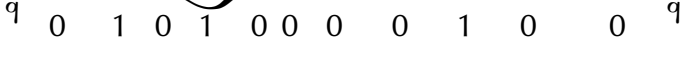
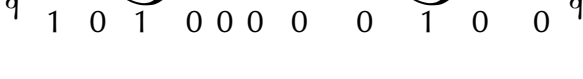
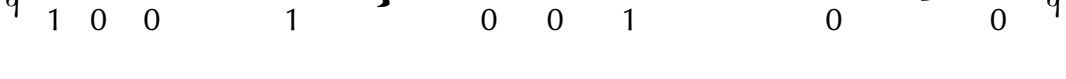
π_q 1 0 0 0 1 0 0 π_q

π_q 1 0 0 0 1 0 0 π_q

00010100 π_q 0 0 0 1 0 1 0 0 π_q

01000100 π_q 0 1 0 0 0 1 0 0 π_q

First Mode - Sticheraric

0100010X	π_q  π_q
000100100	π_q  π_q
0X0100100	π_q  π_q
001000100	π_q  π_q
100000100	π_q  π_q
	π_q  π_q
0001000100	π_q  π_q
0100000100	π_q  π_q
0101000100	π_q  π_q
00100100100	π_q  π_q
01010000100	π_q  π_q
10100000100	π_q  π_q
100100100	π_q  π_q

First Mode - Sticheraric

10100010100 π_q 1 0 1 0 0 0 1 0 1 0 0 π_q

10100100100 π_q 1 0 1 0 0 1 0 0 1 0 0 π_q

01000010100 π_q 0 1 0 0 0 0 1 0 1 0 0 π_q

010100000100 π_q 0 1 0 1 0 0 0 0 0 1 0 0 π_q

Ga - Pa

X00 π_q X 0 0 π_q

0010X π_q X 0 1 0 X π_q X

01010X π_q 0 1 0 1 0 X π_q 0 1

10010X π_q 1 0 0 1 0 X π_q

00100100 π_q 0 0 1 0 0 1 0 0 π_q

0001010100 π_q 0 0 0 1 0 1 0 1 0 0 π_q

D) Accented on Fourth to Last Syllable

Pa - Pa

1000 $\pi \overline{\underset{1}{\text{q}}} \overline{\text{0}} \overline{\text{0}} \overline{\text{0}} \pi \overline{\text{q}}$

1010 $\pi \overline{\text{q}} \overline{\text{1}} \overline{\text{0}} \overline{\text{1}} \overline{\text{0}} \pi \overline{\text{q}}$

X001 $\pi \overline{\text{q}} \overline{\text{X}} \overline{\text{0}} \overline{\text{0}} \overline{\text{1}} \pi \overline{\text{q}}$

$\overline{\text{X}}$

X010 $\pi \overline{\text{q}} \overline{\text{X}} \overline{\text{0}} \overline{\text{1}} \overline{\text{0}} \pi \overline{\text{q}}$

$\pi \overline{\text{q}} \overline{\text{X}} \overline{\text{0}} \overline{\text{1}} \overline{\text{0}} \pi \overline{\text{q}}$

$\pi \overline{\text{q}} \overline{\text{X}} \overline{\text{0}} \overline{\text{1}} \overline{\text{0}} \pi \overline{\text{q}}$

XXX1 $\pi \overline{\text{q}} \overline{\text{X}} \overline{\text{X}} \overline{\text{X}} \overline{\text{1}} \pi \overline{\text{q}}$

01000 $\pi \overline{\text{q}} \overline{\text{0}} \overline{\text{1}} \overline{\text{0}} \overline{\text{0}} \overline{\text{0}} \pi \overline{\text{q}}$

$\pi \overline{\text{q}} \overline{\text{0}} \overline{\text{1}} \overline{\text{0}} \overline{\text{0}} \overline{\text{0}} \pi \overline{\text{q}}$

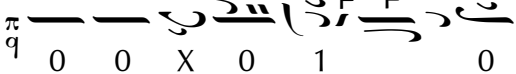
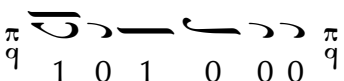
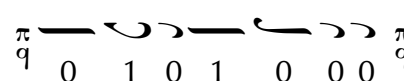

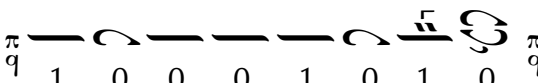
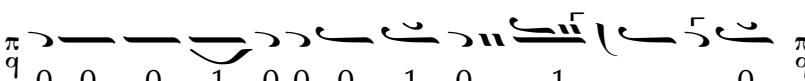
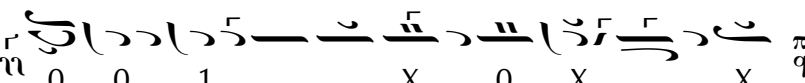
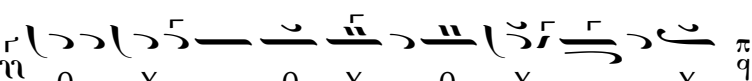
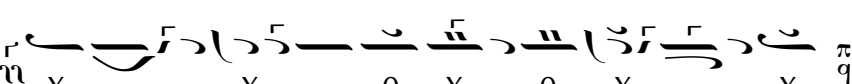
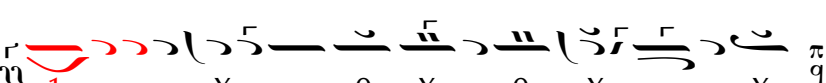

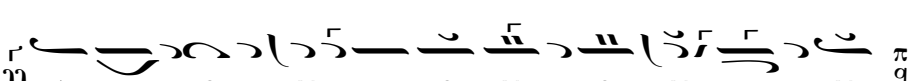
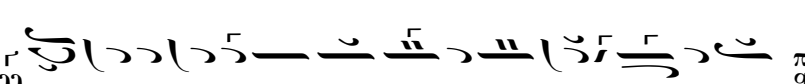
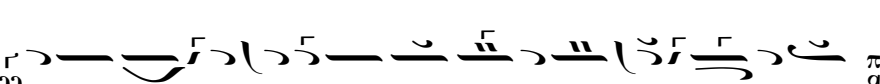
01001 $\pi \overline{\text{q}} \overline{\text{0}} \overline{\text{1}} \overline{\text{0}} \overline{\text{0}} \overline{\text{1}} \pi \overline{\text{q}}$

$\overline{\text{1}}$

0100X $\pi \overline{\text{q}} \overline{\text{0}} \overline{\text{1}} \overline{\text{0}} \overline{\text{0}} \overline{\text{X}} \pi \overline{\text{q}}$

010XX $\pi \overline{\text{q}} \overline{\text{0}} \overline{\text{1}} \overline{\text{0}} \overline{\text{X}} \overline{\text{X}} \pi \overline{\text{q}}$

First Mode - Sticheraric

00X010	π_q  π_q		
101000	π_q  π_q	0101000	π_q  π_q
01010XX	π_q  π_q		
10001010	π_q  π_q		
00010001010	π_q  π_q		
<u>Ga - Pa</u>			
001X0XX	π_q  π_q		
0X0X0XX	π_q  π_q		
XX0X0XX	π_q  π_q		
1X0X0XX	π_q  π_q		
10X0X0XX	π_q  π_q		
X0X0X0XX	π_q  π_q		
01X0X0XX	π_q  π_q		

Medial Cadences on Ga

Note: the initial martyria of these formulae is usually arbitrary. In other words, a formula that begins with a martyria of Ga and an apostrophos can be replaced by a martyria of Pa with an oligon, and vice versa.

E) Accented on Last Syllable

Pa - Ga

01	$\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{r} \end{array} \begin{array}{c} \text{—} \\ \text{n} \end{array}$
001	$\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{d} \end{array} \begin{array}{c} \text{—} \\ \text{n} \end{array}$
0001	$\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{r} \end{array} \begin{array}{c} \text{—} \\ \text{n} \end{array}$
000001	$\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{r} \end{array} \begin{array}{c} \text{—} \\ \text{n} \end{array}$
00010001	$\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{r} \end{array} \begin{array}{c} \text{—} \\ \text{n} \end{array}$
10010001	$\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{r} \end{array} \begin{array}{c} \text{—} \\ \text{n} \end{array}$
001000001	$\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{r} \end{array} \begin{array}{c} \text{—} \\ \text{n} \end{array}$
100010001	$\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{r} \end{array} \begin{array}{c} \text{—} \\ \text{n} \end{array}$

Ga - Ga

101	$\pi \begin{array}{c} \text{—} \\ \text{r} \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{r} \end{array} \begin{array}{c} \text{—} \\ \text{n} \end{array}$
-----	--

First Mode - Sticheraric

10001 1 0 0 0 1

00001 0 0 0 0 1

0 0 0 0 1

010001 0 1 0 0 0 1

0 1 0 0 0 1

0 1 0 0 0 1

1

F) Accented on Second to Last Syllable

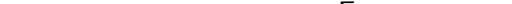
Pa - Ga[illegible]
$$00010 \quad \begin{array}{c} \pi \\ q \end{array} \begin{array}{c} \curvearrowright \\ 0 \end{array} \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \text{---} \\ 1 \end{array} \begin{array}{c} \curvearrowleft \\ 0 \end{array} \begin{array}{c} r \\ n \end{array}$$
$$\begin{array}{ccccccc} & & \pi & & & & \\ & & \downarrow & & \downarrow & & \\ 10010 & & q & & 1 & 0 & 0 & 1 & 0 & r \\ & & & & & & & & & n \end{array}$$

π_q $\overline{0}$ $\overline{1}$ $\overline{0}^\Gamma$ $\overline{0}$ $\overline{1}$ $\overline{0}$ r_n

$$\pi_q \begin{array}{ccccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 1 & 0 & & 0 & 1 & 0 \end{array} r_n$$
$$\pi_q \begin{array}{cccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 1 & 0 & 0 & 1 & 0 \end{array} r_n$$

π_q

010010 r_n

0010010 π_q  q

$$\begin{array}{cccccccc} \pi & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ q & 0 & 0 & 1 & 0 & 0 & 1 & 0 \end{array} \quad r$$
$$\begin{array}{ccccccc} \pi_q & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & r_q \\ & 0 & 0 & 1 & 0 & 0 & 1 & 0 \end{array}$$
$$\pi_q \xrightarrow{0} \xrightarrow{0} \xrightarrow{1} \xrightarrow{\pi} \xrightarrow{0} \xrightarrow{0} \xrightarrow{1} \xrightarrow{\pi} \xrightarrow{0} \xrightarrow{\Delta} \mathcal{A}$$

00010010 π_q 0 0 0 1 0 0 1 0 r_n

First Mode - Sticheraric

π
q 0 0 0 1 0 0 1 0 n

π
q 0 0 0 1 0 0 1 0 n

π
q 0 0 0 1 0 0 1 0 n

0010000010

π
q 0 0 1 0 0 0 0 1 0 n

10100100010

π
q 1 0 1 0 0 1 0 0 0 1 0 n

Ga - Ga

010

n 0 1 0 n

n 0 1 0 n

1010

n 1 0 1 0 n

X010

n X 0 1 0 n

10010

n 1 0 0 1 0 n

n 1 0 0 1 0 n

0

n 1 0 0 1 0 Δ

First Mode - Sticheraric

010010	
10X010	
0010010	
0100010	

G) Accented on Third to Last Syllable

Pa - Ga

100


$$\pi_q \begin{array}{c} \text{---} \\ 1 \end{array} \rightsquigarrow \begin{array}{c} \text{---} \\ 0 \end{array} \rightsquigarrow \begin{array}{c} \text{---} \\ 0 \end{array} \rightsquigarrow \begin{array}{c} \text{---} \\ 0 \end{array} \rightsquigarrow \begin{array}{c} \text{---} \\ 0 \end{array}$$

0

0100 $\pi_q \overline{}_0 \overline{}_1 \overline{}_0 \overline{}_0 r_n$

$$\pi_q \xrightarrow{0} \xrightarrow{1} \xrightarrow{0} \xrightarrow{0} \xrightarrow{1} \pi_n$$
$$\pi_q \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \text{---} \\ 1 \end{array} \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \text{---} \\ 0 \end{array} r_n$$
$$\pi_q \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} \eta$$

0110X

10101 π_q  q

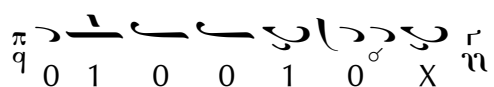
01010X

000100 π_q 0 0 0 1 0 0 r_n

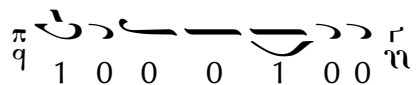
010100 π_q 0 1 0 1 0 σ 0 r_n

$$010010X \quad \begin{matrix} \pi \\ q \end{matrix} \quad \begin{matrix} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 1 & 0 & 0 & 1 & 0 & X \end{matrix} \quad \begin{matrix} r \\ n \end{matrix}$$

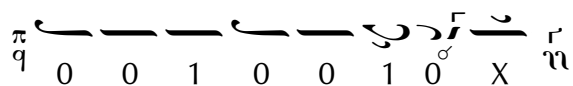
First Mode - Sticheraric

π_q  π_n

1000100

π_q  π_n

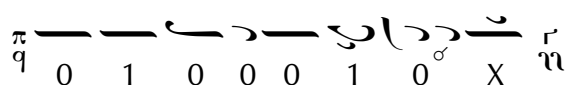
0010010X

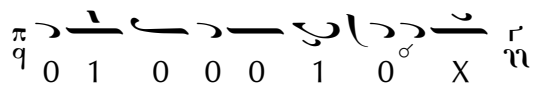
π_q  π_n

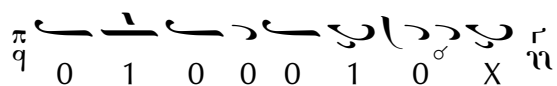
0101010X

π_q  π_n

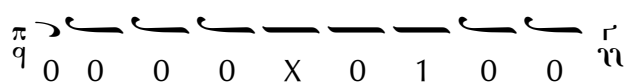
0100010X

π_q  π_n

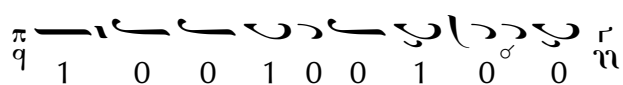
π_q  π_n

π_q  π_n

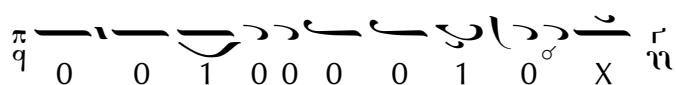
0000X0100

π_q  π_n

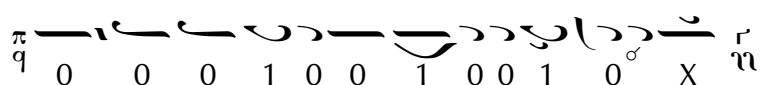
100100100

π_q  π_n

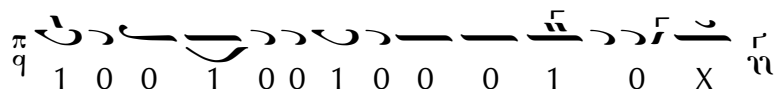
001000010X

π_q  π_n

00010010010X

π_q  π_n

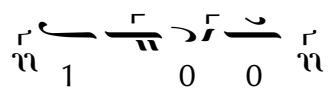
100100100010X

π_q  π_n

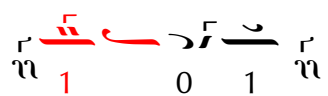
Ga - Ga

First Mode - Sticheraric

100



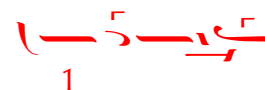
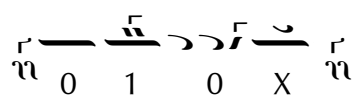
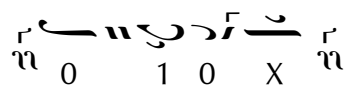
101



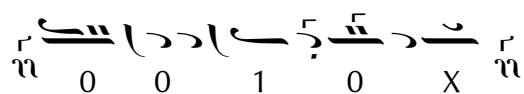
10X



010X




0010X



H) Accented on Fourth to Last Syllable

Pa - Ga
$$100X \quad \pi_q \left(\frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \rightarrow \frac{1}{X} \right) \quad r_n$$

001001 π_q 

0101010

π_q $\underbrace{\quad}_0$ $\underbrace{\quad}_1$ $\underbrace{\quad}_0$ $\underbrace{\quad}_1$ $\underbrace{\quad}_0$ $\underbrace{\quad}_1$ $\underbrace{\quad}_0$ r_n

010X010

π
q

0 1 0 X 0 1 0

r

$$\begin{array}{ccccccc} \pi & \text{---} & \text{---} & \text{---} & \overline{\text{---}} & \text{---} & \text{---} \\ q & 0 & 1 & 0 & x & 0 & 1 & 0 & r \\ & & & & & & & & n \end{array}$$

100X010

π_q 1 0 0 X 0 1 0 r_n

0010X010

π_q 0 0 1 0 X 0 1 0 r_n

$$\begin{array}{ccccccccccc} \pi & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ q & 0 & 0 & 1 & 0 & X & 0 & 1 & 0 & r & n \end{array}$$

π

01001001

$\frac{\pi}{q}$

0 1 0 0 1 0 0 1 r

Ga - Ga

100X $\frac{1}{n} \frac{1}{1} \frac{1}{0} \frac{1}{0} \frac{1}{x} \frac{1}{n}$

First Mode - Sticheraric

1010 ᵿ 1 0 1 0 ᵿ

X010 ᵿ X 0 1 0 ᵿ

01001 ᵿ 0 1 0 0 1 ᵿ

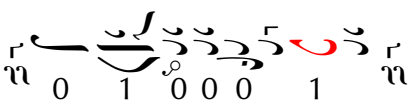
00100X ᵿ 0 0 1 0 0 X ᵿ

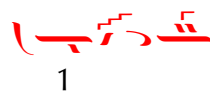
10X010 ᵿ 1 0 X 0 1 0 ᵿ

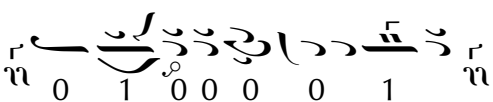
ᵿ 1 0 X 0 1 0 ᵿ


I) Ga - High Nee - Ga

100 

010001 



0100001 

0100010 

J) Medial Cadences on Low Di

π_q

0010

$$\pi_q \begin{array}{c} \circ \\ \curvearrowright \\ 0 \end{array} \curvearrowright \begin{array}{c} \ulcorner \\ \curvearrowright \\ 0 \end{array} \curvearrowright \begin{array}{c} \equiv \\ \curvearrowright \\ 1 \end{array} \curvearrowright \begin{array}{c} \lrcorner \\ \curvearrowright \\ 0 \end{array} \curvearrowright \begin{array}{c} \ulcorner \\ \curvearrowright \\ 0 \end{array} \quad q_\Delta$$

0010X

$$\pi_q \begin{array}{c} \circ \\ \curvearrowright \\ 0 \end{array} \rightarrow \begin{array}{c} \ulcorner \\ \curvearrowright \\ 0 \end{array} \rightarrow \begin{array}{c} \equiv \\ \curvearrowright \\ 1 \end{array} \rightarrow \begin{array}{c} \curvearrowright \\ \curvearrowright \\ 0 \end{array} \rightarrow \begin{array}{c} \curvearrowright \\ \curvearrowright \\ x \end{array} \rightarrow \begin{array}{c} q \\ \Delta \end{array}$$
$$\pi_q \rightarrow \underbrace{\quad}_0 \rightarrow \underbrace{\quad}_0 \rightarrow \underbrace{\quad}_1 \rightarrow \underbrace{\quad}_0 \rightarrow \underbrace{\quad}_X \rightarrow q_\Delta$$

X0010X


A diagram illustrating a character mapping. On the left, the character 'X' is shown in blue. On the right, the character '0' is shown in red. A red arrow points from the 'X' to the '0', indicating a mapping or transformation.

$$\pi_q \xrightarrow{\quad} \frac{\pi_q}{X} \xrightarrow{\quad} \frac{\pi_q}{0} \xrightarrow{\quad} \frac{\pi_q}{0} \xrightarrow{\quad} \frac{\pi_q}{1} \xrightarrow{\quad} \frac{\pi_q}{0} \xrightarrow{\quad} \frac{\pi_q}{X} \xrightarrow{\quad} q_{\Delta}$$
$$\overset{\pi}{\underset{q}{\curvearrowright}} \underset{X}{\curvearrowright} \underset{0}{\curvearrowright} \underset{0}{\curvearrowright} \underset{1}{\curvearrowright} \underset{0}{\curvearrowright} \underset{X}{\curvearrowright} \underset{\Delta}{\curvearrowright} q$$

Cadences on Low Ke:


[illegible]

K) Formulae with Fthoras

010 π_q 

π_q

$$01XX \quad \pi^q \circlearrowleft_0 - \overline{\pi}^q_1 \circlearrowright_X \circlearrowleft_X \circlearrowright_{\pi^q}$$

00100 π_9  π_5

10001


π_q
 Δ
 π_q

$$\pi_q \frac{\overline{\mathcal{H}}}{1} \rightsquigarrow \rightsquigarrow \rightsquigarrow \rightsquigarrow \frac{\overline{\mathcal{H}}}{0} \rightsquigarrow \frac{\Delta}{\mathcal{H}} \rightsquigarrow \frac{\Delta}{\mathcal{H}}$$


010010

π_q

[illegible]

100010 π_9 

0100100

π_q 

0 1 0 0 1 0 0 z

1000100

1 0 0 0 1 0 0

0100100 π 0 1 0 0 1 Δ

$$\pi_q \begin{array}{ccccccccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 1 & & 0 & 0 & 1 & & 0 & & 0 & \Delta \\ & & & & & & & & & & \end{array}$$

L) Old (slow) Sticheraric Formulae

(Syllables after a cross are repeated syllables)

Accented on last syllable:

01 π_q $\underbrace{\quad}_0$ $\underbrace{\quad}_1$ $\underbrace{\quad}_2$ $\underbrace{\quad}_3$ $\underbrace{\quad}_4$ $\underbrace{\quad}_5$ $\underbrace{\quad}_6$ $\underbrace{\quad}_7$ $\underbrace{\quad}_8$ $\underbrace{\quad}_9$ π_q

π_q

[illegible]

X01

$\pi_q \quad \text{X} \quad 0 \quad 1 \quad \pi_q$

0001

$$\frac{1}{1} \frac{1}{2} \frac{1}{0} \frac{1}{0} \frac{1}{0} \frac{1}{1} \frac{1}{q} \pi$$

0001

$$\frac{\Delta}{\partial} \frac{\gamma}{0} \frac{\gamma}{0} \frac{\gamma}{0} \frac{\gamma}{0} \frac{\gamma}{1} \frac{\gamma}{2} \frac{\gamma}{0}$$
$$\underbrace{\quad}_0 \quad \underbrace{\quad}_0 \quad \underbrace{\quad}_1 \quad \pi_q$$

10001

[illegible]

First Mode - Sticheraric

10001

$$\pi_q \frac{z}{1} \frac{\tau}{\tau-1} z^{-n} (-z)^{-r_0} \frac{\tau}{\tau-1} z^{-r_0} (-z)^{-r_0} \frac{z}{1} \frac{\tau}{\tau-1} z^{-n} \frac{\tau}{\tau-1} z^{-n} \frac{\tau}{\tau-1} z^{-n} \frac{\tau}{\tau-1} z^{-n}$$

010001

$$\pi_q \begin{array}{c} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \\ 0 \quad 1 \quad \quad 0 \quad \quad 0 \quad 0 \quad 1 \end{array} \pi_q$$

Accented on second to last syllable:

010 $\frac{\Delta}{d_1}$ 0 1 0 $\frac{\pi}{9}$

[illegible]
$$\underbrace{\quad}_0 \quad \underbrace{\quad}_2 \quad \pi_q$$

0010

$$\frac{\Delta}{\delta_1} \left(\underbrace{\text{---}}_0 \text{---} \underbrace{\text{---}}_0 \text{---} \underbrace{\text{---}}_1 \text{---} \underbrace{\text{---}}_2 \text{---} \underbrace{\text{---}}_0 \right) \frac{\pi}{q}$$

X010

First Mode - Sticheraric

π_q χ 0 1 0

π_q

00010 0 0 0 1 0

0 π_q

0000010 0 0 0 0 0 1 0 0

Accented on third to last syllable:

100 1 0 0

100 1 0 1 0 0 0


1 0 1 0 0 0

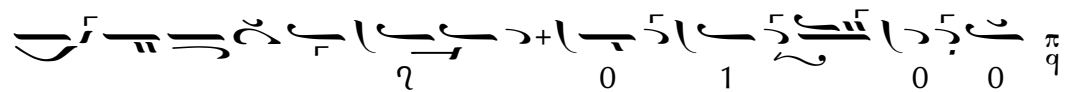
0100 0 1 0 1 0 0 0 0

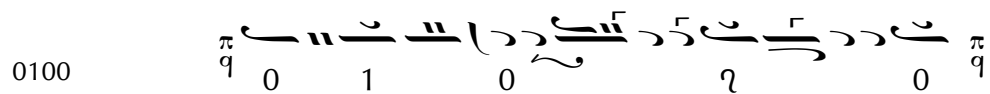
0100 0 1 0 0 0 0

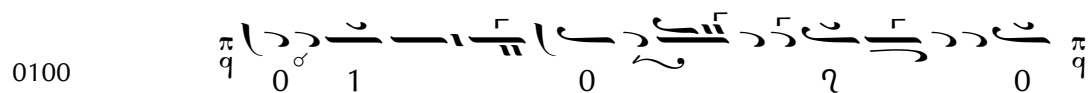
0100

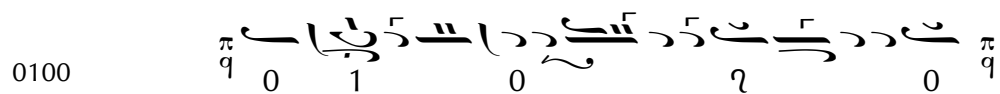
First Mode - Sticheraric

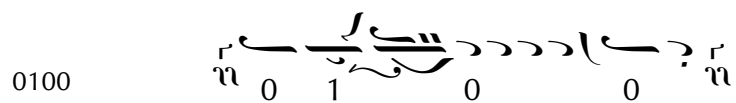
π_q  0 1 2 0

 2 0 1 0 0 π_q

0100 π_q  0 1 0 2 0 π_q

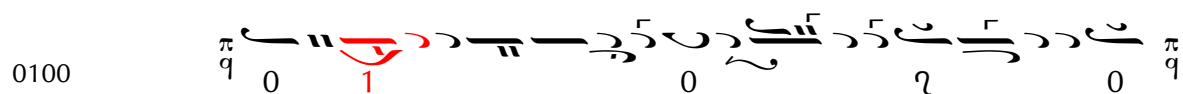
0100 π_q  0 1 0 2 0 π_q

0100 π_q  0 1 0 2 0 π_q

0100 π_q  0 1 0 0 π_q

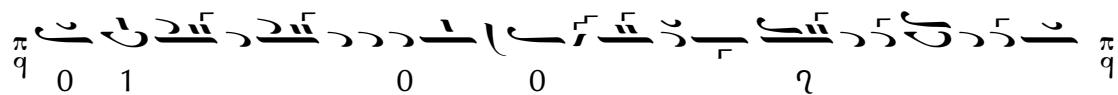
0100 π_q  0 1 0 0 π_q

 1

0100 π_q  0 1 0 2 0 π_q

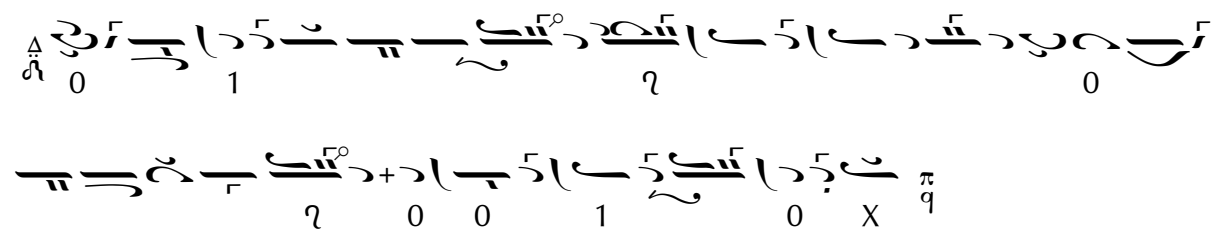
 1

0100

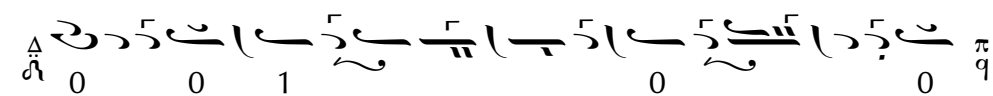
π_q  0 1 0 0 2 π_q

First Mode - Sticheraric

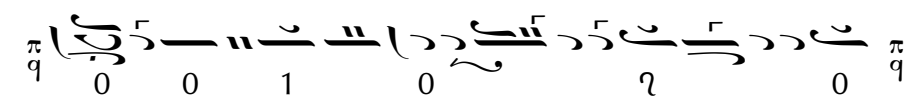
010X



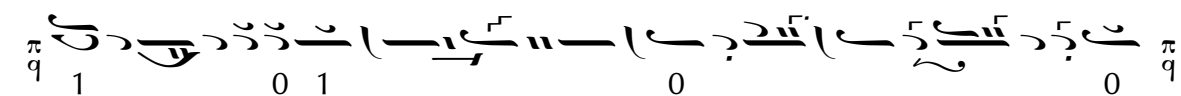
00100



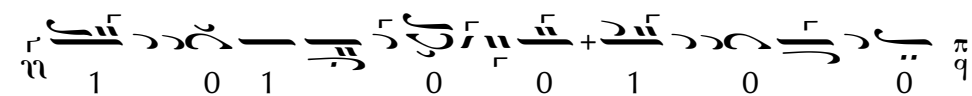
00100



10100



10100



000100

First Mode - Sticheraric

$\frac{x}{q} \begin{array}{cccccccccccc} \text{⌒} & \text{⌒} & \text{⌒} & \text{⌒} & \text{♂} & \text{⌒} & \text{⌒} & \text{⌒} & \text{⌒} & \text{⌒} & \text{⌒} & \text{⌒} \\ 0 & 0 & 0 & 1 & & 0 & & & & & 2 & 0 & 0 & 0 \end{array}$

$$\begin{array}{ccccccc} \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \pi \\ 1 & \sim & & 0 & 0 & & q \end{array}$$

0010100 π $\frac{1}{q}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{\infty}$ $\frac{1}{\frac{1}{2}}$ $\frac{1}{\frac{1}{3}}$ $\frac{1}{\frac{1}{4}}$ $\frac{1}{\frac{1}{5}}$ $\frac{1}{\frac{1}{6}}$ $\frac{1}{\frac{1}{7}}$ $\frac{1}{\frac{1}{8}}$ $\frac{1}{\frac{1}{9}}$ $\frac{1}{\frac{1}{10}}$ $\frac{1}{\frac{1}{11}}$ $\frac{1}{\frac{1}{12}}$ $\frac{1}{\frac{1}{13}}$ $\frac{1}{\frac{1}{14}}$ $\frac{1}{\frac{1}{15}}$ $\frac{1}{\frac{1}{16}}$ $\frac{1}{\frac{1}{17}}$ $\frac{1}{\frac{1}{18}}$ $\frac{1}{\frac{1}{19}}$ $\frac{1}{\frac{1}{20}}$ $\frac{1}{\frac{1}{21}}$ $\frac{1}{\frac{1}{22}}$ $\frac{1}{\frac{1}{23}}$ $\frac{1}{\frac{1}{24}}$ $\frac{1}{\frac{1}{25}}$ $\frac{1}{\frac{1}{26}}$ $\frac{1}{\frac{1}{27}}$ $\frac{1}{\frac{1}{28}}$ $\frac{1}{\frac{1}{29}}$ $\frac{1}{\frac{1}{30}}$ $\frac{1}{\frac{1}{31}}$ $\frac{1}{\frac{1}{32}}$ $\frac{1}{\frac{1}{33}}$ $\frac{1}{\frac{1}{34}}$ $\frac{1}{\frac{1}{35}}$ $\frac{1}{\frac{1}{36}}$ $\frac{1}{\frac{1}{37}}$ $\frac{1}{\frac{1}{38}}$ $\frac{1}{\frac{1}{39}}$ $\frac{1}{\frac{1}{40}}$ $\frac{1}{\frac{1}{41}}$ $\frac{1}{\frac{1}{42}}$ $\frac{1}{\frac{1}{43}}$ $\frac{1}{\frac{1}{44}}$ $\frac{1}{\frac{1}{45}}$ $\frac{1}{\frac{1}{46}}$ $\frac{1}{\frac{1}{47}}$ $\frac{1}{\frac{1}{48}}$ $\frac{1}{\frac{1}{49}}$ $\frac{1}{\frac{1}{50}}$ $\frac{1}{\frac{1}{51}}$ $\frac{1}{\frac{1}{52}}$ $\frac{1}{\frac{1}{53}}$ $\frac{1}{\frac{1}{54}}$ $\frac{1}{\frac{1}{55}}$ $\frac{1}{\frac{1}{56}}$ $\frac{1}{\frac{1}{57}}$ $\frac{1}{\frac{1}{58}}$ $\frac{1}{\frac{1}{59}}$ $\frac{1}{\frac{1}{60}}$ $\frac{1}{\frac{1}{61}}$ $\frac{1}{\frac{1}{62}}$ $\frac{1}{\frac{1}{63}}$ $\frac{1}{\frac{1}{64}}$ $\frac{1}{\frac{1}{65}}$ $\frac{1}{\frac{1}{66}}$ $\frac{1}{\frac{1}{67}}$ $\frac{1}{\frac{1}{68}}$ $\frac{1}{\frac{1}{69}}$ $\frac{1}{\frac{1}{70}}$ $\frac{1}{\frac{1}{71}}$ $\frac{1}{\frac{1}{72}}$ $\frac{1}{\frac{1}{73}}$ $\frac{1}{\frac{1}{74}}$ $\frac{1}{\frac{1}{75}}$ $\frac{1}{\frac{1}{76}}$ $\frac{1}{\frac{1}{77}}$ $\frac{1}{\frac{1}{78}}$ $\frac{1}{\frac{1}{79}}$ $\frac{1}{\frac{1}{80}}$ $\frac{1}{\frac{1}{81}}$ $\frac{1}{\frac{1}{82}}$ $\frac{1}{\frac{1}{83}}$ $\frac{1}{\frac{1}{84}}$ $\frac{1}{\frac{1}{85}}$ $\frac{1}{\frac{1}{86}}$ $\frac{1}{\frac{1}{87}}$ $\frac{1}{\frac{1}{88}}$ $\frac{1}{\frac{1}{89}}$ $\frac{1}{\frac{1}{90}}$ $\frac{1}{\frac{1}{91}}$ $\frac{1}{\frac{1}{92}}$ $\frac{1}{\frac{1}{93}}$ $\frac{1}{\frac{1}{94}}$ $\frac{1}{\frac{1}{95}}$ $\frac{1}{\frac{1}{96}}$ $\frac{1}{\frac{1}{97}}$ $\frac{1}{\frac{1}{98}}$ $\frac{1}{\frac{1}{99}}$ $\frac{1}{\frac{1}{100}}$

$$\pi_q \circ \mathcal{J}_0$$

0100100

[illegible]

0100100

$$\begin{array}{ccccccc} \text{\tiny Γ} & \text{\tiny Σ} & \text{\tiny Ξ} & \text{\tiny Λ} & \text{\tiny Π} & \text{\tiny Ψ} & \text{\tiny Ω} \\ n_0 & 1 & & 0 & 0 & 1 & \\ & & & & & & 0 \\ & & & & & & ? \end{array}$$
$$\int_0^{\pi} \frac{1}{\sqrt{1-\cos^2 \theta}} d\theta$$

0100100

First Mode - Sticheraric

$\frac{7}{0} \rightarrow \frac{5}{1} \rightarrow \frac{3}{2} \rightarrow \frac{1}{3} \rightarrow \frac{0}{4}$

$$\frac{1}{0} \pi q$$

0100100

[illegible]
$$\frac{2\pi}{0} \rightarrow \frac{\pi}{9}$$

1000100

$\frac{r}{n} \frac{r}{m} \frac{r}{l} \frac{r}{k} \frac{r}{j} \frac{r}{i} \frac{r}{h} \frac{r}{g} \frac{r}{f} \frac{r}{e} \frac{r}{d} \frac{r}{c} \frac{r}{b} \frac{r}{a}$

$$\underbrace{\quad}_{\gamma} \underbrace{\quad}_0 \underbrace{\quad}_{\gamma} \underbrace{\quad}_0$$
$$\frac{\pi}{9} \begin{matrix} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 1 & \sim & 0 & 0 \end{matrix}$$

000100

First Mode - Sticheraric

[illegible][illegible][illegible]

Accented on fourth to last syllable:

1010 \bar{n}_1 $\bar{0}$ $\bar{1}$ $\bar{\pi}_q$

[illegible]
$$\frac{1}{0} \pi_9$$

01001 π_q $\underbrace{\quad}_0$ $\underbrace{\quad}_1$ $\underbrace{\quad}_0$ $\underbrace{\quad}_1$ $\underbrace{\quad}_0$ $\underbrace{\quad}_1$ π_q

01001 π_q $\underbrace{\quad}_0$ $\underbrace{\quad}_1$ $\underbrace{\quad}_0$ $\underbrace{\quad}_1$ $\underbrace{\quad}_0$ $\underbrace{\quad}_1$ π_q

01001

[illegible]

M) Semi-Final Formulae

Ga - Di

(these formulae are immediately followed by the formulae in section O)

Accented on last syllable:

1 $\overset{\frown}{\underset{1}{\text{u}}} \overset{\Delta}{\text{a}}$

01 $\overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{1}{\text{u}}} \overset{\Delta}{\text{a}}$

$\overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{1}{\text{u}}} \overset{\Delta}{\text{a}}$

$\overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{1}{\text{u}}} \overset{\Delta}{\text{a}}$

011 $\overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{1}{\text{u}}} \overset{\frown}{\underset{1}{\text{u}}} \overset{\Delta}{\text{a}}$

101 $\overset{\frown}{\underset{1}{\text{u}}} \overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{1}{\text{u}}} \overset{\Delta}{\text{a}}$

0101 $\overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{1}{\text{u}}} \overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{1}{\text{u}}} \overset{\Delta}{\text{a}}$


1001 $\overset{\frown}{\underset{1}{\text{u}}} \overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{1}{\text{u}}} \overset{\Delta}{\text{a}}$

$\overset{\frown}{\underset{1}{\text{u}}} \overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{1}{\text{u}}} \overset{\Delta}{\text{a}}$

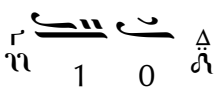
01001 $\overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{1}{\text{u}}} \overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{1}{\text{u}}} \overset{\Delta}{\text{a}}$

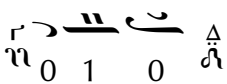
010001 $\overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{1}{\text{u}}} \overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{0}{\text{u}}} \overset{\frown}{\underset{1}{\text{u}}} \overset{\Delta}{\text{a}}$

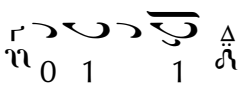
First Mode - Sticheraric

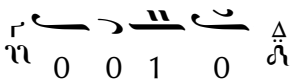
001001 

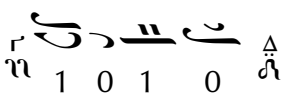
Accented on second to last syllable:

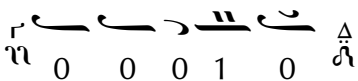
10 

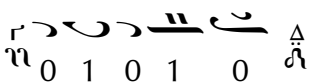
010 


011 

0010 

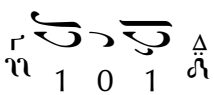
1010 

00010 

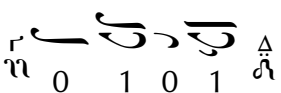
01010 

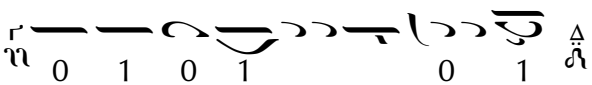
010010 

Accented on third to last syllable:


101 

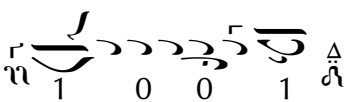
First Mode - Sticheraric

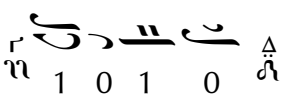
0101 


010101 

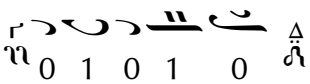
Accented on fourth to last syllable:


1001 



1010 

01001 

01010 

001001 

N) Semi-Final Formulae

Pa - Di

(these formulae are immediately followed by the formulae in section O)

Accented on last syllable:

$$1 \quad \pi \begin{array}{c} \text{q} \\ \text{1} \end{array} \begin{array}{c} \text{ } \\ \text{ } \end{array} \begin{array}{c} \Delta \\ \text{ } \end{array}$$

$$001 \quad \pi \begin{array}{c} \text{q} \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{1} \end{array} \begin{array}{c} \Delta \\ \text{ } \end{array}$$

$$\pi \begin{array}{c} \text{q} \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{1} \end{array} \begin{array}{c} \Delta \\ \text{ } \end{array}$$

$$\pi \begin{array}{c} \text{q} \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{1} \end{array} \begin{array}{c} \Delta \\ \text{ } \end{array}$$

$$0001 \quad \pi \begin{array}{c} \text{q} \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{1} \end{array} \begin{array}{c} \Delta \\ \text{ } \end{array}$$

$$1001 \quad \pi \begin{array}{c} \text{q} \\ \text{1} \end{array} \begin{array}{c} \text{ } \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{1} \end{array} \begin{array}{c} \Delta \\ \text{ } \end{array}$$

Accented on second to last syllable:

$$010 \quad \pi \begin{array}{c} \text{q} \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{1} \end{array} \begin{array}{c} \text{ } \\ \text{ } \end{array} \begin{array}{c} \text{ } \\ \text{0} \end{array} \begin{array}{c} \Delta \\ \text{ } \end{array}$$

$$0010 \quad \pi \begin{array}{c} \text{q} \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{1} \end{array} \begin{array}{c} \text{ } \\ \text{ } \end{array} \begin{array}{c} \text{ } \\ \text{0} \end{array} \begin{array}{c} \Delta \\ \text{ } \end{array}$$

$$\pi \begin{array}{c} \text{q} \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{1} \end{array} \begin{array}{c} \text{ } \\ \text{ } \end{array} \begin{array}{c} \text{ } \\ \text{0} \end{array} \begin{array}{c} \Delta \\ \text{ } \end{array}$$

$$10010 \quad \pi \begin{array}{c} \text{q} \\ \text{1} \end{array} \begin{array}{c} \text{ } \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{0} \end{array} \begin{array}{c} \text{ } \\ \text{1} \end{array} \begin{array}{c} \text{ } \\ \text{0} \end{array} \begin{array}{c} \Delta \\ \text{ } \end{array}$$

First Mode - Sticheraric

00010

π_q 0 0 0 1 Δ 0

010010

π_q 0 1 0 0 1 0 Δ

100010

π_q 1 0 0 0 1 0 Δ

Accented on fourth to last syllable:

1001 π_q $\frac{1}{1}$ $\frac{0}{0}$ $\frac{1}{1}$ $\frac{\Delta}{\mathfrak{A}}$

O) Final Cadences

Di - Pa

(These formulae are preceded by a formula in section M or N)

010X	
0XXX	
0XX0X	
001XX	
101XX	
010X0X	
0001XX	
00100X	
00001XX	
000001XX	

P) Final Cadence for Theotokia

XX

$$\pi_q \left(\underbrace{\mathbb{R}^n}_{X} \times \underbrace{\mathbb{R}^n}_{X} \times \underbrace{\mathbb{R}^n}_{X} \right)$$

BYZANTINE MUSIC FORMULAE

First Mode - Heirmologic

Contents^{*}

A) Medial Cadences on Di.....	72
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Key:

1 = accented syllable

0 = unaccented syllable

X = syllable that may be either
accented or unaccented

Variations of the same formula
are indicated in color

^{*} The Byzantine music formulae herein were extracted from heirmologic melodies found in the Zoe Anastasimatarion (14th edition, 2002).

A) Medial Cadences on Di

Accented on last syllable:

00	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\curvearrowright}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 0 0
	$\overset{\chi}{\underset{\cdot}{\mathfrak{q}}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\epsilon}{\underset{\cdot}{\mathfrak{x}}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 0 0
01	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\curvearrowright}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 0 1
	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\epsilon}{\underset{\cdot}{\mathfrak{x}}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 0 1
001	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 0 0 1
	$\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \overset{\text{—}}{\text{—}} \overset{\text{—}}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 0 0 1
00101	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\curvearrowright}{\text{—}} \overset{\text{—}}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 0 0 1 0 1
10001	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\text{—}}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 1 0 0 0 1
	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\text{—}}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 1 0 0 0 1
	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\text{—}}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\text{—}}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 1 0 0 0 1
X0001	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\text{—}}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ X 0 0 0 1
1000X	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\text{—}}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 1 0 0 0 X

First Mode - Heirmologic

000001

010001

100001

100001

Accented on second to last syllable:

[illegible]

First Mode - Heirmologic

	π q		Δ A
		0 0 1 0	
	π n		Δ A
		0 0 1 0	
00010	Δ A		Δ A
		0 0 0 1 0	
	π q		Δ A
		0 0 0 1 0	
	Δ A		Δ A
		0 0 0 1 0	
	π n		Δ A
		0 0 0 1 0	
10010	Δ A		Δ A
		1 0 0 1 0	
	Δ A		Δ A
		1 0 0 1 0	
	Δ A		Δ A
		1 0 0 1 0	
000010	Δ A		Δ A
		0 0 0 0 1 0	
010010	π n		Δ A
		0 1 0 0 1 0	
	Δ A		Δ A
		0 1 0 0 1 0	
100010	Δ A		Δ A
		1 0 0 0 1 0	
	Δ A		Δ A
		1 0 0 0 1 0	

First Mode - Heirmologic

1000010	
0010010	
0010010	
1010010	
10X0010	
0000010	
010010010	

(The purple notes in this formula are orthographically incorrect, however this combination is frequent in the Zoe *Anastasimatarion*)

Accented on third to last syllable:

100	
-----	--

First Mode - Heirmologic

$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \text{A} & & & & & & \text{A} \\ \text{A} & & & & & & \text{A} \\ \text{A} & & & & & & \text{A} \\ 1 & & & & & & 0 \quad 0 \end{array}$$
$$\begin{array}{c} \Delta \\ \text{A} \end{array} \quad \overline{\text{U}} \quad \text{U} \quad \text{U} \quad \begin{array}{c} \Delta \\ \text{A} \end{array}$$
$$\begin{array}{ccccc} \Delta & \text{---} & \text{---} & \text{---} & \Delta \\ \text{---} & & \text{---} & & \text{---} \\ 1 & & 0 & & 0 \end{array}$$
$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \textcircled{\cdot\cdot} & & & & & & \textcircled{\cdot\cdot} \\ \text{A} & 1 & 0 & 0 & & & \text{A} \end{array}$$
$$\overset{\Delta}{\underset{\cdot\cdot}{\mathfrak{A}}} \curvearrowright 1 \quad \text{---} \quad 0 \quad \text{---} \quad 0 \quad \overset{\Delta}{\underset{\cdot\cdot}{\mathfrak{A}}}$$
[illegible]
$$\begin{array}{c} \Delta \\ \vdots \\ \text{A} \end{array} \quad \begin{array}{c} \text{---} \\ 1 \end{array} \quad \begin{array}{c} \text{---} \\ 0 \end{array} \quad \begin{array}{c} \text{---} \\ 0 \end{array} \quad \begin{array}{c} \Delta \\ \vdots \\ \text{A} \end{array}$$
$$\begin{array}{ccccccc} \Delta & & \overline{f} & & \Delta \\ \text{⌞} & \text{---} & \text{---} & \text{---} & \text{⌞} \\ 1 & & 0 & & 0 \end{array}$$

0100

$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \text{⌞} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{⌞} \\ 0 & 1 & 0 & 0 & & & \end{array}$$

0 1 0 0

$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \text{♩} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{♩} \\ & 0 & 1 & 0 & 0 & & \end{array}$$

1

00100

Δ
 δ 0 0 1 0 0 δ

$$\begin{array}{ccccccccc} \Delta & & & & & & & & \Delta \\ \downarrow & & & & & & & & \downarrow \\ \mathfrak{A} & 0 & 0 & 1 & 0 & 0 & \mathfrak{A} \end{array}$$

First Mode - Heirmologic

00101

X0100

000100

100100

1010100

0100100

1000100

First Mode - Heirmologic

10000100

10010100

Accented on fourth to last syllable:

1001

1010

01001

01010

First Mode - Heirmologic

$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 1 0 1 0

$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 1 0 1 0

001001 $\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 0 1 0 0 1

001010 $\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 0 1 0 1 0

B) Medial Cadences on Ke

Accented on last syllable:

001 $\begin{array}{c} \pi \\ \text{q} \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \text{x} \\ \text{q} \end{array}$
 $\begin{array}{cccc} & 0 & 0 & 1 \end{array}$

1001 $\begin{array}{c} \Delta \\ \text{q} \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \text{x} \\ \text{q} \end{array}$
 $\begin{array}{cccc} & 1 & 0 & 0 & 1 \end{array}$

00001 $\begin{array}{c} \Delta \\ \text{q} \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \text{x} \\ \text{q} \end{array}$
 $\begin{array}{ccccc} & 0 & 0 & 0 & 0 & 1 \end{array}$

Accented on second to last syllable:

10 $\begin{array}{c} \Delta \\ \text{q} \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \text{x} \\ \text{q} \end{array}$
 $\begin{array}{ccc} & 1 & & 0 \end{array}$

010 $\begin{array}{c} \pi \\ \text{q} \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \text{x} \\ \text{q} \end{array}$
 $\begin{array}{ccc} & 0 & 1 & & 0 \end{array}$

0010 $\begin{array}{c} \pi \\ \text{q} \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \text{x} \\ \text{q} \end{array}$
 $\begin{array}{cccc} & 0 & 0 & 1 & 0 \end{array}$

C) Medial Cadences on Ga

Accented on last syllable:

01 $\overset{\Delta}{\underset{\cdot}{\alpha}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\underset{\cdot}{\eta}}$ $\overset{\Delta}{\underset{\cdot}{\alpha}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\underset{\cdot}{\eta}}$

001 $\overset{\Delta}{\underset{\cdot}{\alpha}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\underset{\cdot}{\eta}}$

10001 $\overset{\Delta}{\underset{\cdot}{\alpha}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\underset{\cdot}{\eta}}$

Accented on second to last syllable:

10 $\overset{\Delta}{\underset{\cdot}{\alpha}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\underset{\cdot}{\eta}}$

$\overset{\Delta}{\underset{\cdot}{\alpha}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\underset{\cdot}{\eta}}$

$\overset{\Delta}{\underset{\cdot}{\alpha}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\underset{\cdot}{\eta}}$

010 $\overset{\Delta}{\underset{\cdot}{\alpha}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\underset{\cdot}{\eta}}$

$\overset{\Delta}{\underset{\cdot}{\alpha}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\underset{\cdot}{\eta}}$

$\overset{\Delta}{\underset{\cdot}{\alpha}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\underset{\cdot}{\eta}}$

01000010 $\overset{\Delta}{\underset{\cdot}{\alpha}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\underset{\cdot}{\eta}}$

$\overset{\curvearrowright}{\underset{\cdot}{\eta}}$

Accented on third to last syllable:

100

Δ
α 1 0 0 η

Δ
 $\ddot{\alpha}$

1

$$\begin{array}{cccc} \Delta & \text{U} & \text{L} & \text{r} \\ \text{d} & 1 & 0 & 0 \\ & & & \text{n} \end{array}$$
$$\begin{array}{ccccccc} \Delta & \text{5} & \text{5} & \text{—} & \text{—} & & \text{r} \\ \text{d} & 1 & & 0 & 0 & & \text{n} \end{array}$$
$$\begin{array}{ccccccc} \Delta & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ \mathfrak{A} & 1 & 0 & 0 & 0 & 0 & n \end{array}$$
$$\begin{array}{ccccc} \uparrow & \text{---} & \downarrow & \nearrow & \uparrow \\ n & 1 & 0 & 0 & n \end{array}$$

0100 Δ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{n}$

$$\begin{array}{ccccccc} \Delta & & & & & & \\ \delta & \searrow & \text{---} & \searrow & \text{---} & & r \\ & 0 & 1 & & 0 & 0 & n \end{array}$$

10100

Δ 1 0 1 0 0 n

$$\begin{array}{ccccccc} \Delta & & & \Gamma & & \Gamma & \\ \mathfrak{A} & \curvearrowright & \curvearrowright & \text{---} & \curvearrowright & \text{---} & \text{---} \\ & 1 & 0 & 1 & 0 & 0 & \mathfrak{A} \end{array}$$

Accented on fourth to last syllable:

1001 $\overset{\Delta}{\underset{\cdot}{\mathfrak{d}}}\overset{\curvearrowright}{\underset{\cdot}{\mathfrak{d}}}\overset{\curvearrowright}{\underset{\cdot}{\mathfrak{d}}}\overset{\curvearrowright}{\underset{\cdot}{\mathfrak{d}}}\overset{\curvearrowright}{\underset{\cdot}{\mathfrak{d}}}\overset{\curvearrowright}{\underset{\cdot}{\mathfrak{d}}}$





$$\Delta \underbrace{\quad}_{1} \underbrace{\quad}_{0} \underbrace{\quad}_{0} \underbrace{\quad}_{1} \quad \mathfrak{u}$$

1101 Δ 1 1 0 1 \bar{r}

$$\begin{array}{ccccccc} \Delta & & & & & & \\ \mathfrak{A} & \cup & \cup & \cup & \cup & \cup & \cup \\ & 1 & 1 & 0 & 1 & & \mathfrak{A} \end{array}$$

1010 $\begin{array}{ccccccc} \Delta & & & & & & \\ \text{a} & \text{---} & \text{---} & \text{---} & \text{---} & & \text{r} \\ & 1 & 0 & 1 & 0 & & \text{u} \end{array}$

$$\begin{array}{ccccccc} \Delta & \overline{} & \curvearrowright & \curvearrowright & \neg & \text{---} & \neg \\ d & 1 & 0 & 1 & & 0 & n \end{array}$$

Δ     r
 δ 1 0 1 0 η

1

$$\begin{array}{ccccccc} \pi & \hookrightarrow & \xrightarrow{\quad} & \hookrightarrow & \hookrightarrow & \hookrightarrow & \hookrightarrow \\ q & 1 & 0 & 1 & & 0 & n \end{array}$$

D) Medial Cadences on Pa

Accented on last syllable:

$$01 \quad \pi_q \quad \overset{\circ}{\text{---}} \quad \pi_q$$

001 Δ π
 \bar{q} 0 0 1 q

010001 π_q

0010001

Δ
 δ

0 0 1 0 0 1

π
 q

10010001

Δ
 δ 1 0 0 1 0 0 0 1 π
 q

Accented on second to last syllable:

010 $\overset{\Delta}{\mathfrak{A}}_0 \rightarrow \mathfrak{B}_1 \rightarrow \mathfrak{B}_0 \xrightarrow{\pi_0} \mathfrak{q}$

$$\begin{array}{ccccc} \Delta & & & & \pi \\ \downarrow & \curvearrowright & \color{red}{\curvearrowright} & \curvearrowright & \downarrow \\ \mathfrak{A} & 0 & \color{red}{1} & 0 & \mathfrak{q} \end{array}$$
$$\begin{array}{ccccccc} \Gamma & \hookrightarrow & \Gamma & \hookrightarrow & \Gamma & \hookrightarrow & \pi \\ \mathfrak{U} & & 0 & & 1 & & 0 & & \mathfrak{q} \end{array}$$

0010 $\begin{matrix} \text{r} & \text{r} & \text{u} & \text{r} \\ \text{n} & 0 & 1 & 0 \end{matrix} \pi_q$

$$\begin{array}{ccccccc} & & \pi_q & & & & \pi_q \\ & & \downarrow & & \downarrow & & \downarrow \\ 00010 & & 0 & & 0 & & 0 & & 1 & & 0 & & \pi_q \end{array}$$

0X010 π_q 0 X 0 1 0 π_q

1

First Mode - Heirmologic

10010 $\pi_q \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \pi_q$

100010 $\pi_q \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \pi_q$

Accented on third to last syllable:

100 $\Delta \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$

$\pi_q \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$

$\pi_q \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$

0100 $\Delta \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$

00100 $\pi_q \overbrace{0}^{\sim} \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$

10100 $\Delta \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$

1X100 $\pi_q \overbrace{1}^{\sim} \overbrace{X}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$

100100 $\pi_q \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$

$\Delta \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$

$\Delta \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \pi_q$

10010X $\Delta \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{0}^{\sim} \overbrace{1}^{\sim} \overbrace{0}^{\sim} \overbrace{X}^{\sim} \pi_q$

First Mode - Heirmologic

00X0100 $\overset{\Delta}{\underset{\pi}{\mathfrak{A}}} \overbrace{0}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overline{X} \overline{0} \underbrace{1}_{\curvearrowleft} \overbrace{0}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \pi_{\mathfrak{q}}$

1000100 $\overset{\Delta}{\underset{\pi}{\mathfrak{A}}} \underbrace{1}_{\curvearrowleft} \overbrace{0}^{\curvearrowright} \overline{0} \overline{0} \underbrace{1}_{\curvearrowleft} \overbrace{0}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \pi_{\mathfrak{q}}$

X0X0100 $\overset{\Delta}{\underset{\pi}{\mathfrak{A}}} \overbrace{X}^{\curvearrowright} \overline{0} \overline{X} \overline{0} \underbrace{1}_{\curvearrowleft} \overbrace{0}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \pi_{\mathfrak{q}}$

Accented on fourth to last syllable:

0X010 $\pi_{\mathfrak{q}} \overbrace{0}^{\curvearrowright} \overline{X} \overline{0} \overline{1} \overbrace{0}^{\curvearrowright} \pi_{\mathfrak{q}}$

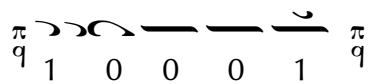
01010 $\overline{\mathfrak{A}} \overline{0} \overbrace{1}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{1}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \pi_{\mathfrak{q}}$

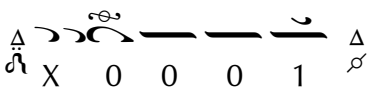
001010 $\overline{\mathfrak{A}} \overbrace{0}^{\curvearrowright} \overline{0} \overbrace{1}^{\curvearrowright} \overline{0} \overline{1} \overbrace{0}^{\curvearrowright} \pi_{\mathfrak{q}}$

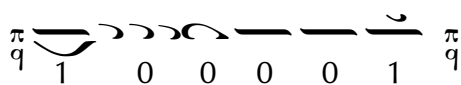
E) Formulae with Fthores

Accented on last syllable:

10001 



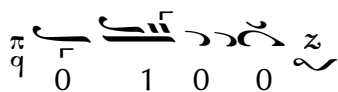
X0001 

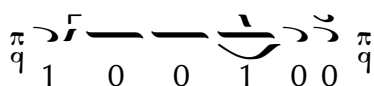
100001 

Accented on second to last syllable:

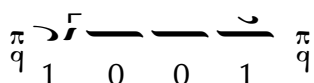
0100010 

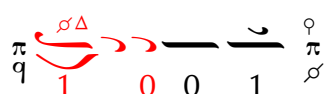
Accented on third to last syllable:

0100 

100100 

Accented on fourth to last syllable:

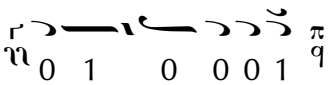
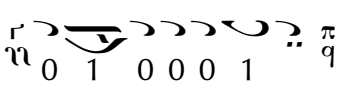
1001 

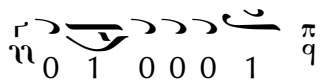





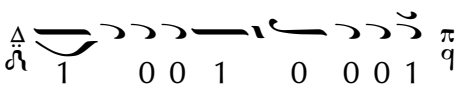
F) Ending Formulae

Accented on last syllable:

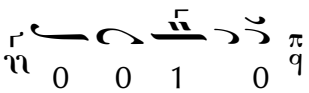
010001  

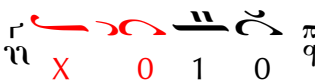
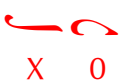


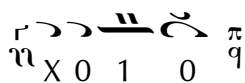
0100001 

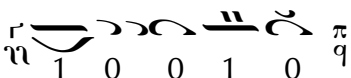
10010001 

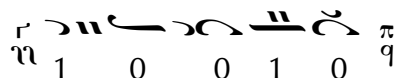
Accented on second to last syllable:

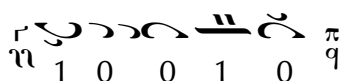
0010 

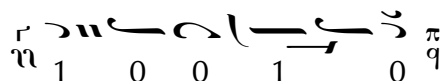
X010  

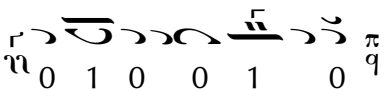


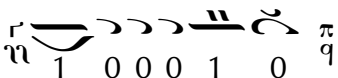
10010 









010010 

100010 


First Mode - Heirmologic


0100010 

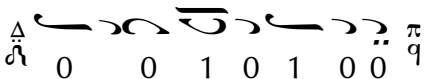
Accented on third to last syllable:

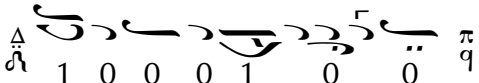
0100 

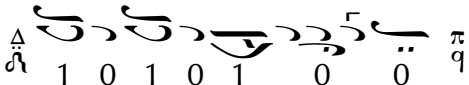
00100 

100100 

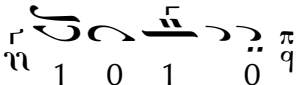



0010100 

1000100 

1010100 

Accented on fourth to last syllable:

1010 

X010 

First Mode - Heirmologic

$\overset{\curvearrowright}{\underset{\curvearrowright}{\mathfrak{A}}} \overset{\curvearrowright}{\times} 0 \overset{\curvearrowright}{1} \overset{\curvearrowright}{0} \overset{\pi}{\mathfrak{q}}$

01001

$\overset{\curvearrowright}{\underset{\curvearrowright}{\mathfrak{A}}} \overset{\curvearrowright}{0} \overset{\curvearrowright}{1} \overset{\curvearrowright}{0} \overset{\curvearrowright}{0} \overset{\curvearrowright}{\underset{\curvearrowright}{\mathfrak{A}}} \overset{\pi}{\mathfrak{q}}$

$\overset{\curvearrowright}{\underset{\curvearrowright}{\mathfrak{A}}} \overset{\pi}{\mathfrak{q}}$
1

001001

$\overset{\curvearrowright}{\underset{\curvearrowright}{\mathfrak{A}}} \overset{\curvearrowright}{0} \overset{\curvearrowright}{0} \overset{\curvearrowright}{1} \overset{\curvearrowright}{0} \overset{\curvearrowright}{0} \overset{\curvearrowright}{\underset{\curvearrowright}{\mathfrak{A}}} \overset{\pi}{\mathfrak{q}}$

$\overset{\curvearrowright}{\underset{\curvearrowright}{\mathfrak{A}}} \overset{\pi}{\mathfrak{q}}$
1

10X010

$\overset{\curvearrowright}{\underset{\curvearrowright}{\mathfrak{A}}} \overset{\curvearrowright}{1} \overset{\curvearrowright}{0} \overset{\curvearrowright}{\times} 0 \overset{\curvearrowright}{1} \overset{\curvearrowright}{0} \overset{\pi}{\mathfrak{q}}$

1001001

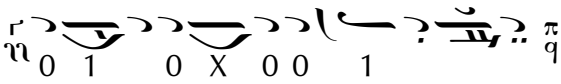
$\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}} \overset{\curvearrowright}{1} \overset{\curvearrowright}{0} \overset{\curvearrowright}{0} \overset{\curvearrowright}{1} \overset{\curvearrowright}{0} \overset{\curvearrowright}{0} \overset{\curvearrowright}{1} \overset{\curvearrowright}{\underset{\curvearrowright}{\mathfrak{A}}} \overset{\pi}{\mathfrak{q}}$

G) Endings for Theotokia*

Accented on last syllable:

(Also use formulae ending in 100)

From Ga


010X001 

Accented on second to last syllable:

From Ga

10010 

010010 

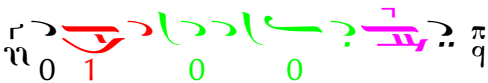
10100010 

Accented on third to last syllable:

From Ga

0100 

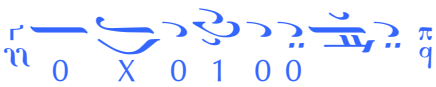








* The formulae in blue in this section are from the Athonite oral tradition, as represented in the book *Παρακλητική, Μουσικὸν Ἐγκόλπιον, Πλάγιοι Ἦχοι, Ἱεροθέου Ἱερομονάχου*, ἐκδόσεις Ἱ.Μ. Φιλοθέου, Ἁγίον Ὄρος, 2004.

First Mode - Heirmologic

0X0100 


100100  

0010100 

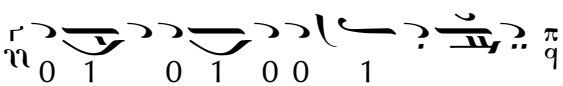
0100100 

From Di

100100 

Accented on fourth to last syllable:

From Ga

0101001 



Second Mode



BYZANTINE MUSIC FORMULAE

Second Mode - Sticheraric

Contents*

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Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

* The Byzantine music formulae herein were extracted from sticheraric melodies found in the *Zoe Anastasimatarion* (14th edition, 2002) Volume I of *Mousike Kypsele* (1883 edition), and the two-volume *Athonias* (1906 edition) by Petros Philanthidis.

A) Initial Formulae: Di - Zo

(These formulae may also be used as medial formulae)

The following formulae are followed by the formulae on next page

101

X010 X̄ 0 1 0

0100 $\frac{A}{0} \text{ --- } \overline{0100} \frac{z'}{0}$

$$\underset{0}{\underset{\cdot}{\Delta}} \text{---} \underset{1}{\text{''}} \text{---} \underset{0}{\text{)} } \text{---} \underset{0}{\text{'}} \text{---} \underset{\cdot}{\underset{\cdot}{\Delta'}} \quad (\text{medial formula})$$

1000 1 0 0 0

01010 Δ — — ∪ ∩ ∞ z'

0 1 0 1 0

01000

010010 $\underbrace{\quad\quad\quad}_{0} \underbrace{\quad\quad\quad}_{1} \underbrace{\quad\quad\quad}_{0} \underbrace{\quad\quad\quad}_{0} \underbrace{\quad\quad\quad}_{1} \underbrace{\quad\quad\quad}_{0}$

100101 1 0 0 1 0 1

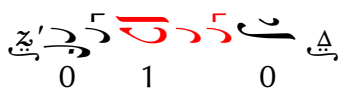

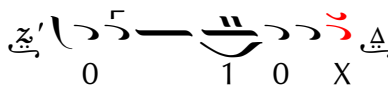
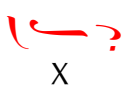




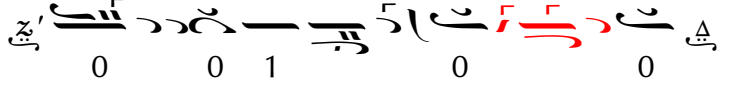

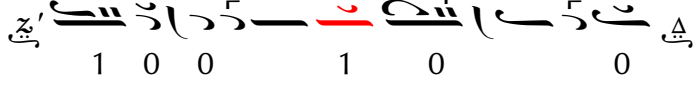

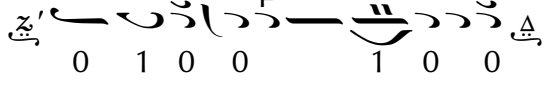
001001 Δ $\overline{\Delta}$ $\overline{\Delta}$ $\overline{\Delta}$ $\overline{\Delta}$ $\overline{\Delta}$ $\overline{\Delta}$

1000101 ۱ ۰ ۰ ۰ ۱ ۰ ۱ ۱۰۱

10001001 ۱ ۰ ۰ ۰ ۱ ۰ ۰ ۱

B) Semi-initial Formulae: Zo - Di

(to be preceded by any of the formulae in section A or E)

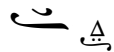
010		
010X		
0100		
00100		
		
100100		
0100100		

C) Medial Formulae ending on Di

(Most of these may also be used as initial formulae)

Note that most of these formulae from Di can also be used as formulae from Vou simply by changing the first character. For example, the first note in the third entry can be changed from an elaphron to an ison if the initial martyria is changed from Di to Vou.

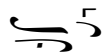
Also note that when a cadence ends on Di with a klasma, the klasma may be replaced by kentemata or by an antikenoma with an aple. So the cadence:



may be written as:

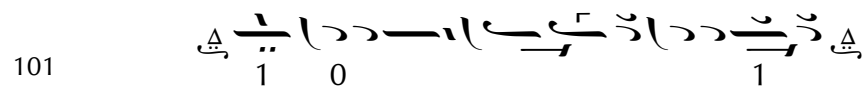


or as:

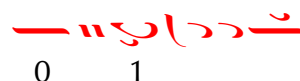
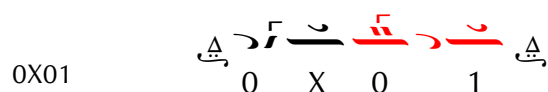
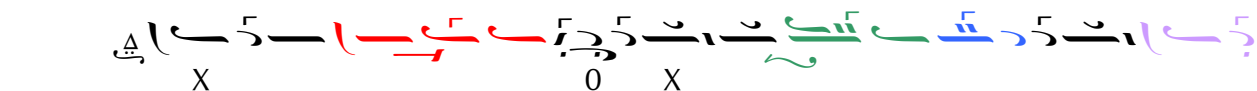


in order to flow more smoothly into the next formula.

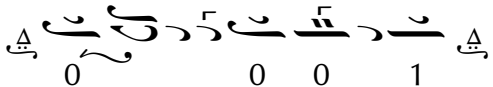
Accented on last syllable:

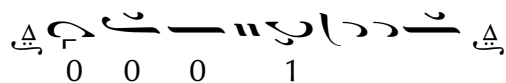


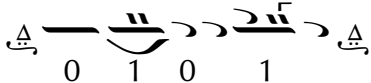
X01



Second Mode - Sticheraric

0001 

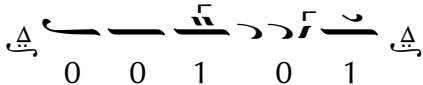


0101 

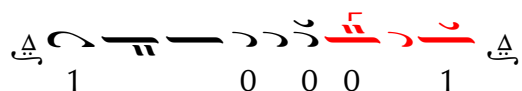
X001

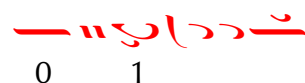


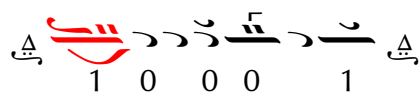


00101 

10001 

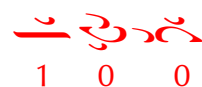










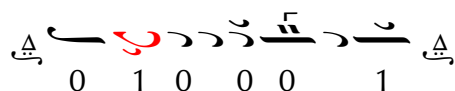


100001 

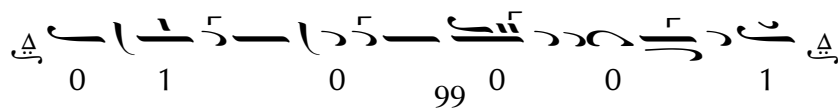


010001 










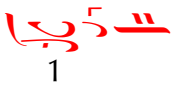
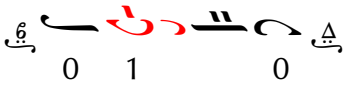

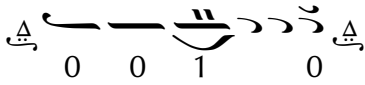
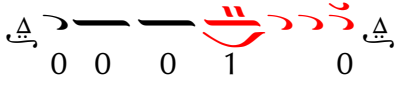

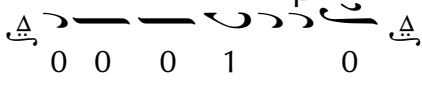
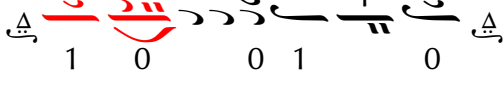

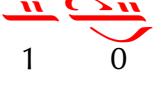
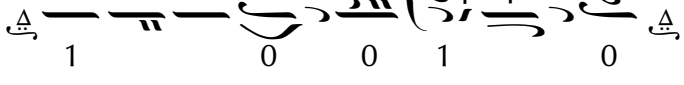
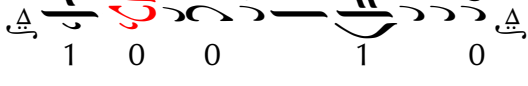




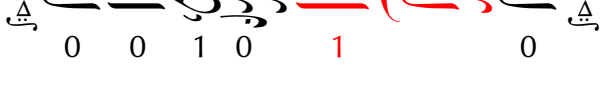

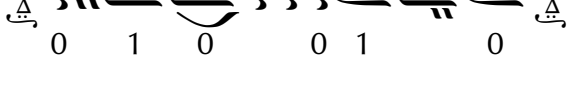



Second Mode - Sticheraric

01X001		

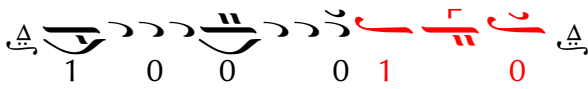


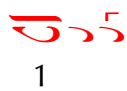
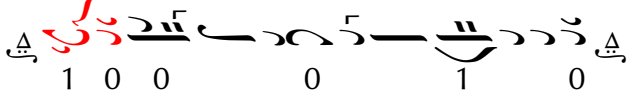

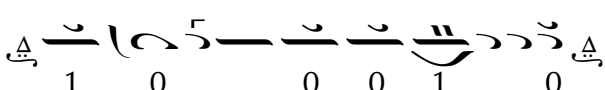
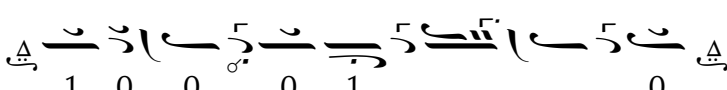
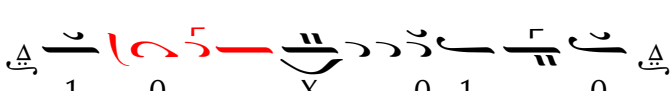


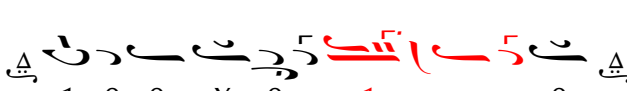
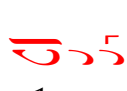




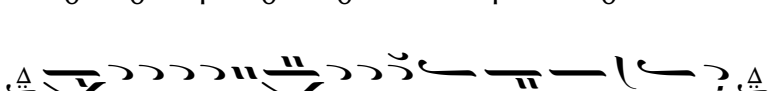


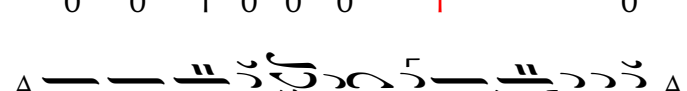
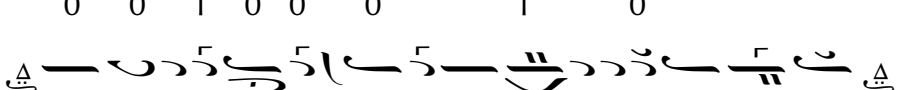
Accented on second to last syllable:

10		
010		

Second Mode - Sticheraric

		
		
0010		
00010		
		
10010		 
		
		
00X010		
00X010		
		
010010		
		
		

Second Mode - Sticheraric

100010	 1 0 0 0 1 0	 1 0
	 1 0 0 0 1 0	 1
	 1 0 0 0 1 0	 1 0
	 1 0 0 0 1 0	
	 1 0 0 0 1 0	
10X010	 1 0 X 0 1 0	 0
100X010	 1 0 0 X 0 1 0	
	 1 0 0 X 0 1 0	 1
	 1 0 0 X 0 1 0	
0010010	 0 0 1 0 0 1 0	 1
	 0 0 1 0 0 1 0	
1000010	 1 0 0 0 0 1 0	
00100010	 0 0 1 0 0 0 1 0	 1
	 0 0 1 0 0 0 1 0	
01000010	 0 1 0 0 0 0 1 0	

Second Mode - Sticheraric

00010010 1

00100X010 1

Accented on third to last syllable:

100 0

1

0

0

1

0

101 1

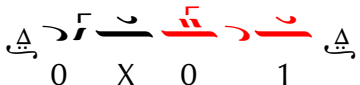
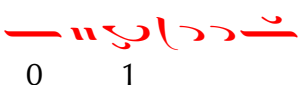



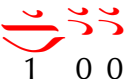
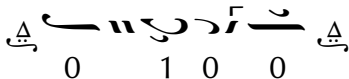
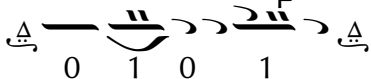
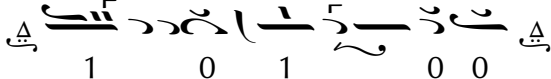
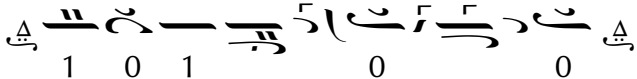
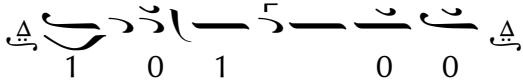


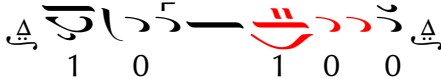

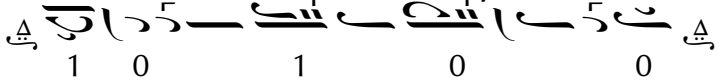

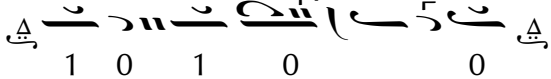
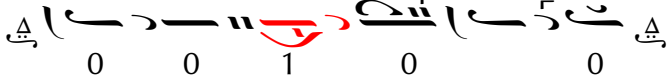

10X X

10X



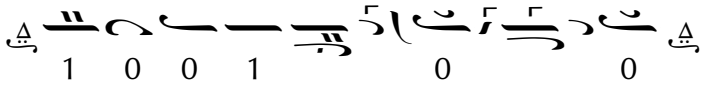
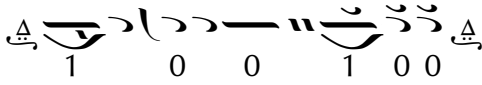

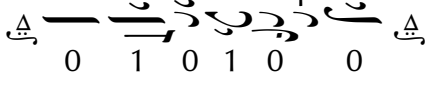
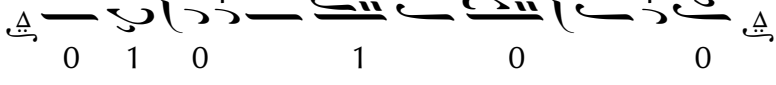
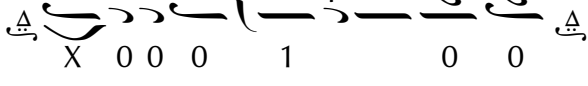
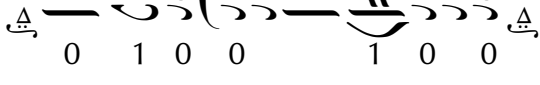



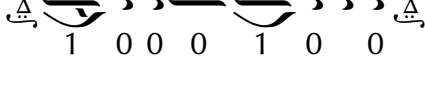
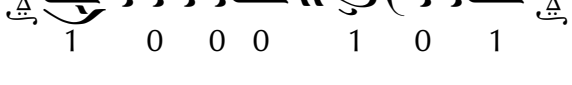
X

1

Second Mode - Sticheraric

0X01		
0100		
		
		
0101		
10100		
		
		
		
		
		
		
		
00100		

Second Mode - Sticheraric

000100	
100100	
	
	
010100	
	
	
X000100	
0100100	
	
	
1010100	
1000100	
1000101	

Second Mode - Sticheraric

01000100		
10010100		

Accented on fourth to last syllable:

1000		
1001		
1X01		
1010		
X00X		

Second Mode - Sticheraric

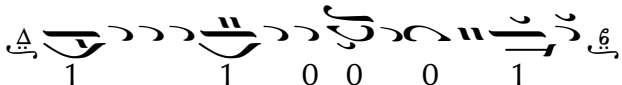
00X010	
101010	
10X010	
100X010	
00100X010	
0101001010	

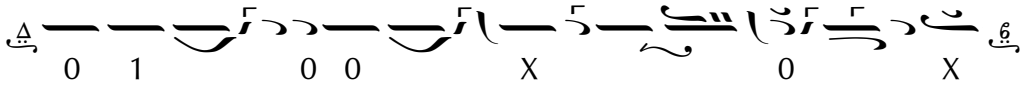
D) Medial Cadences on Vou

Accented on last syllable:

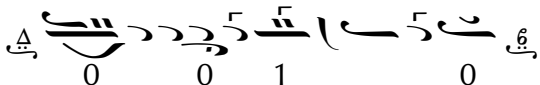
10001		
010001		
100001		

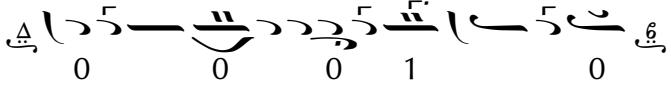
Second Mode - Sticheraric

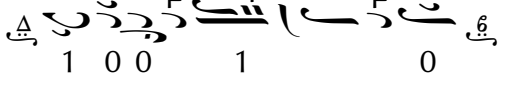
110001 

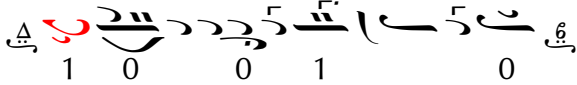

0100X0X 

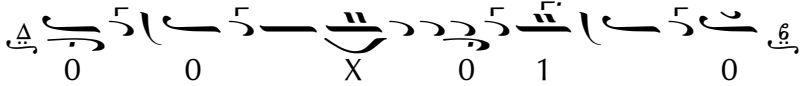
Accented on second to last syllable:

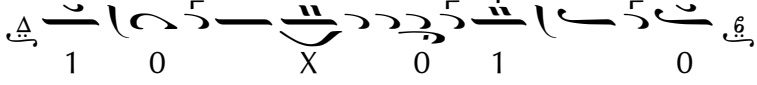
0010 

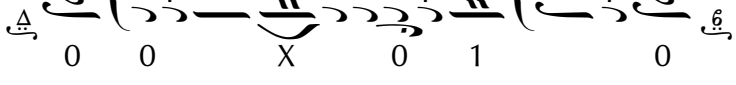
00010 

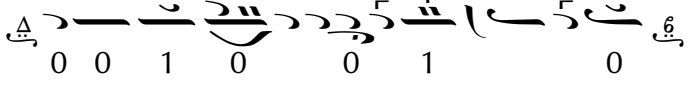
10010 

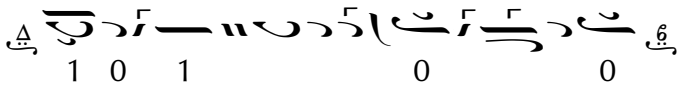
00X010 

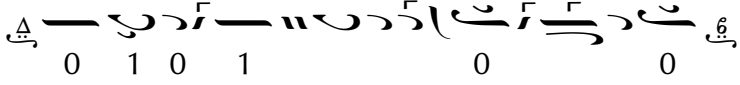
10X010 

00X010 

0010010 

Accented on third to last syllable:

10100 

010100 

Second Mode - Sticheraric

100100

0100100

0100X0X

0110100

1000100

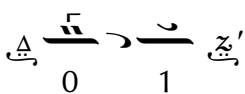
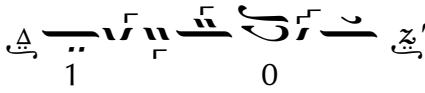
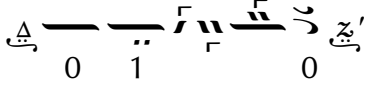

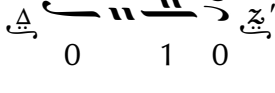
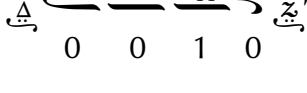
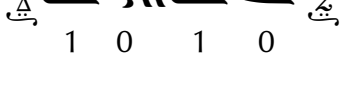
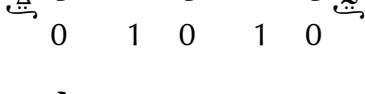
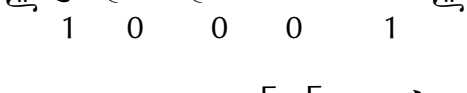

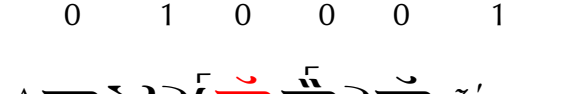
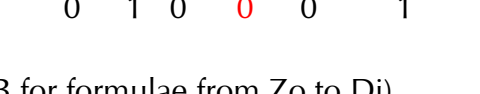
01000100

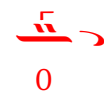
Second Mode - Sticheraric

Accented on fourth to last syllable:

1001		
00X010		
10X010		
00X010		
1001010		
01001001		
010001001		

E) Medial Cadences on High Zo

01	
10	
010	
	
	
0010	
1010	
01010	
10001	
00010	
010001	
	



(See section B for formulae from Zo to Di)

F) Low Nee

1) Cadences on Ga:

(usually followed by an ending on Nee or low Zo)


Accented on last syllable:


(use a formula ending in 100)


Accented on second to last syllable:

010	
0010	
00010	
10010	
100010	
0010010	

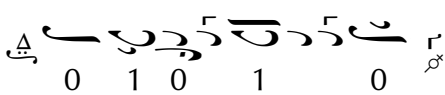
Accented on third to last syllable:

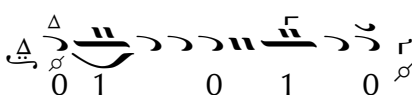
100 


0100100 

00100100 

Accented on fourth to last syllable:

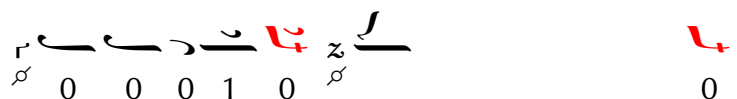
01010 

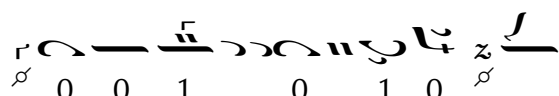


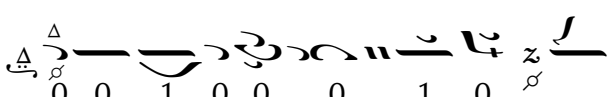


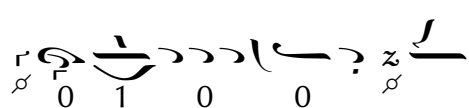
2) Cadences on low Zo:

(to be followed by an ending on Nee on next page)

00010 

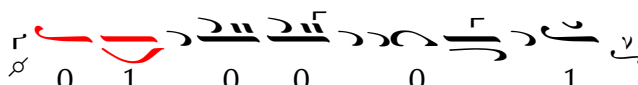

001010 

00100010 

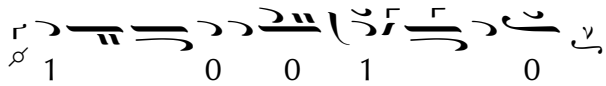
0100  (this formula is not followed by a cadence on Nee)

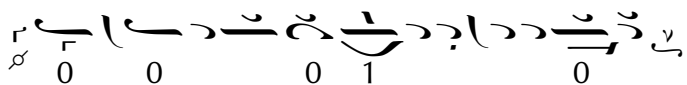
3) Cadences on Nee:

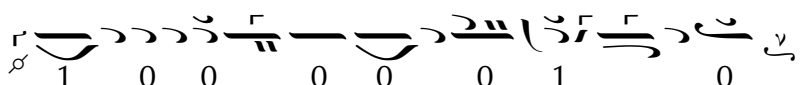
Accented on last syllable:

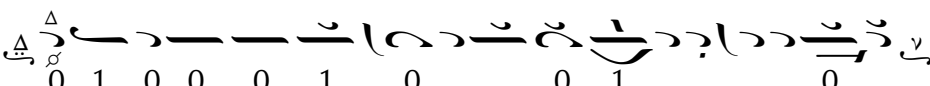
010001  

Accented on second to last syllable:

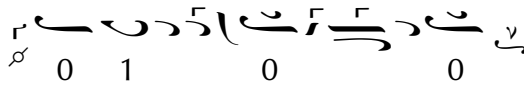
10010 


00010 

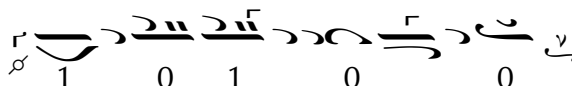
10000010 

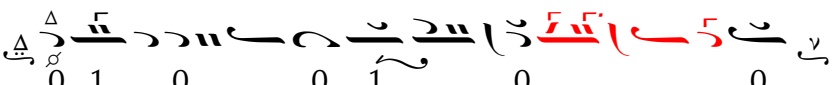

0100010010 

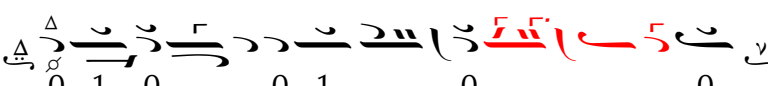

Accented on third to last syllable:

0100 

00100 

10100 

0100100  

Second Mode - Sticheraric

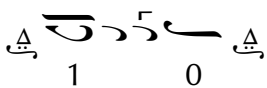
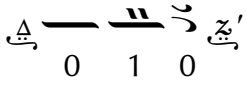


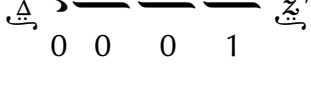
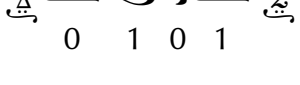
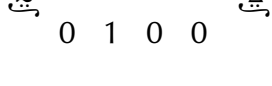
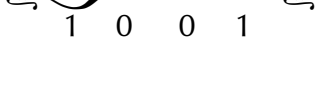
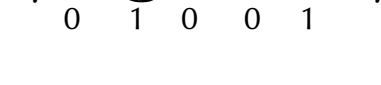
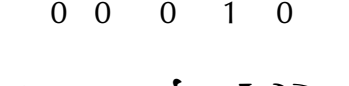
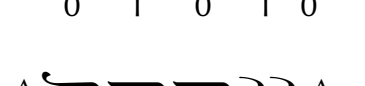
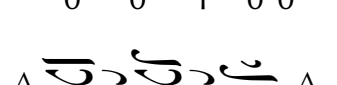
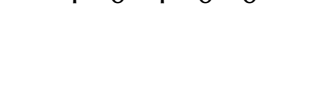
001000100 Δ
 σ 0 0 1 0 0 0 1 0 0 0 γ

010010100 Δ
 σ 0 1 0 0 1 0 1 0 0 0 γ

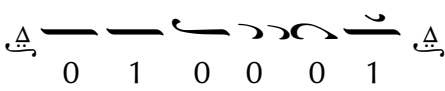
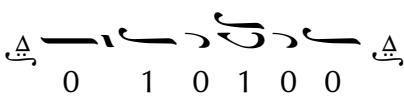
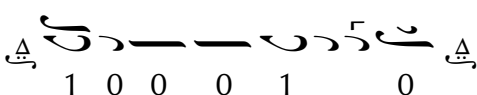
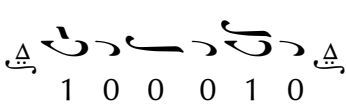
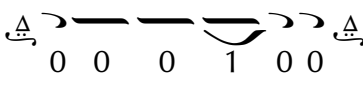

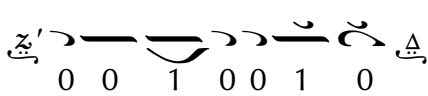

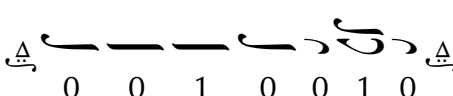
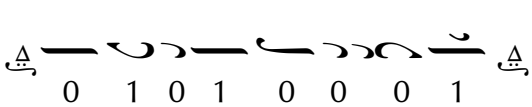
1000101000100 Δ
 σ 1 0 0 0 1 0 1 0 0 0 1 0 0 0 γ

G) Bridges

The following heirmological bridges represent only a fraction of the dozens of bridges permitted. These were selected simply as a reminder of some typical musical gestures of this mode.

10	
010	
100	
0100	
0001	
0101	
0100	
1001	
01001	
00010	
01010	
00100	
10100	

Second Mode - Sticheraric

010001	
010100	
100010	
	
000100	
0010001	
0010010	
0100010	
0010010	
01010001	

H) Formulae with Fthoras

100	
0010	
0100	
00010	
10001	
01010	
0X100	
10100	

Formulae with fthores ending on high Nee:

(to be followed by an ending on Di in next subsection)

10		010	
0X01			
10001			
10001			

Formulae with fthores Nee-Di:

(to be preceded by an ending on high Nee in previous subsection)

100010

0100010


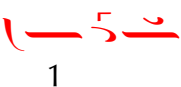




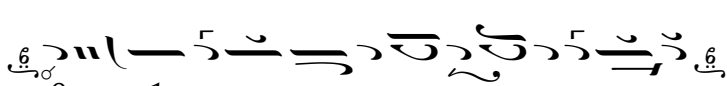
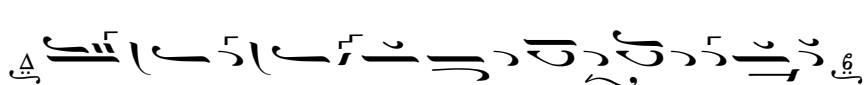
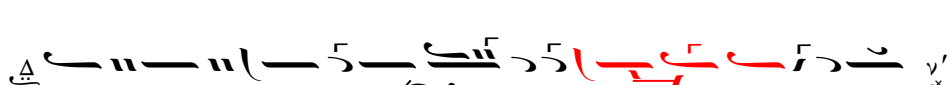

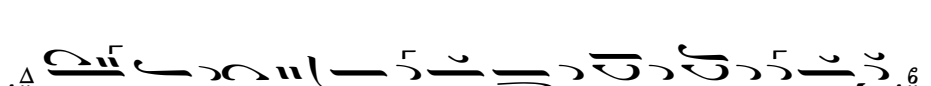




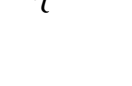

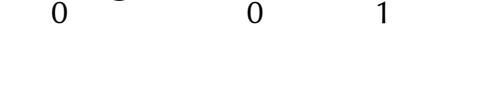
(1)X01010

0100100

I) Old (slow) Sticheraric Formulae


(Syllables after a cross are repeated syllables)

Accented on last syllable:

01		
01		
01		
01		
01		
01		
001		
001		
001		
001		
001		
001		

Second Mode - Sticheraric

XOX






X00X




0001 $\Delta \rightarrow \frac{\Gamma}{0} \rightarrow \frac{\Gamma}{0} \rightarrow \overline{\cup} \rightsquigarrow \overline{\cup} \rightsquigarrow \frac{\Gamma}{1} \rightsquigarrow \frac{\Gamma}{1} \rightsquigarrow \Delta$

0001 $\begin{array}{ccccccc} \text{A} & \text{C} & \text{C} & \text{C} & \text{C} & \text{C} & \text{C} \\ 0 & 0 & 0 & 1 & & & \end{array}$

0001

$$(\underbrace{\quad}_{\text{q}} \underbrace{\quad}_{\text{0}} \underbrace{\quad}_{\text{1}})_{\Delta}$$

1001

$\frac{f}{1} \sim \frac{g}{0} \sim \frac{h}{0} \sim \frac{i}{1} \sim \frac{j}{\Delta}$

00001 $\begin{array}{ccccccccc} \Delta & \curvearrowright & \searrow & \downarrow & \dashv & \curvearrowright & \nearrow & \downarrow & \dashv & \curvearrowright & \Delta \\ 0 & 0 & & 0 & & 0 & 1 & & & & \end{array}$

$\frac{1}{10001} \cdot \frac{\pi}{q}$

10001

$\frac{A}{1} \rightarrow 0 \rightarrow 0 \rightarrow 0 \rightarrow 1 \rightarrow \dots \rightarrow A$

Second Mode - Sticheraric

010001

$$\begin{array}{ccccccc} \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} \\ \text{0} & 1 & & & & & 0 \end{array}$$

010001

010001

[illegible]

010001

$$\underbrace{\quad}_{0} + \underbrace{\quad}_{1} \underbrace{\quad}_{0} \underbrace{\quad}_{0} \underbrace{\quad}_{0} \underbrace{\quad}_{1} \underbrace{\quad}_{1} \underbrace{\quad}_{1}$$

X010001

01010001

[illegible]

Accented on second to last syllable:


Second Mode - Sticheraric

[illegible]

Second Mode - Sticheraric


0010 

$$\frac{1}{0} \Delta$$

0010 


0010 

[illegible]

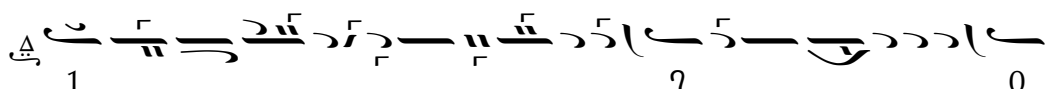
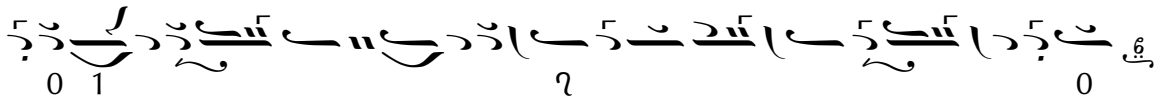
X010 


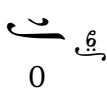
[illegible][illegible]
$$\underbrace{\quad\quad\quad}_1 \quad \underbrace{\quad\quad\quad}_0 \quad \underbrace{\quad\quad\quad}_0$$

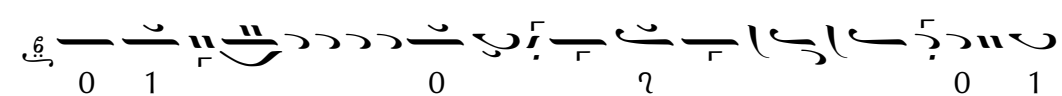
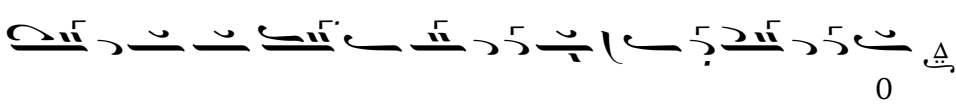
00010 Δ \hookrightarrow \hookrightarrow \hookrightarrow \dots \hookrightarrow \hookrightarrow \hookrightarrow \hookrightarrow \hookrightarrow \hookrightarrow γ'
0 0 0 1 2 0 α


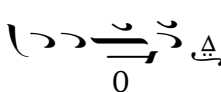
0x010 
0 0 0 1 0 0 0

Second Mode - Sticheric

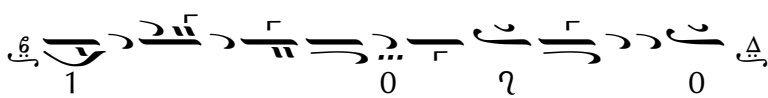
10010  

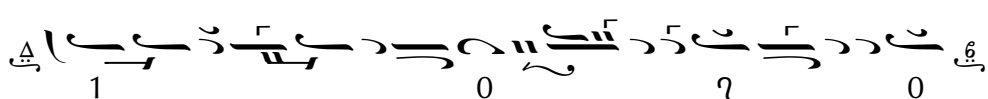
10010  

010010  

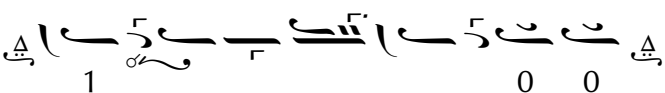
010010  

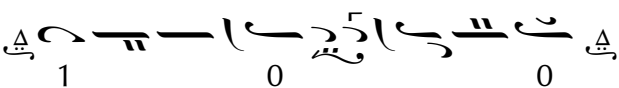
Accented on third to last syllable:

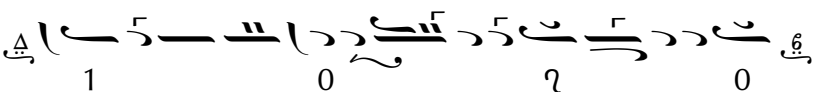
100 

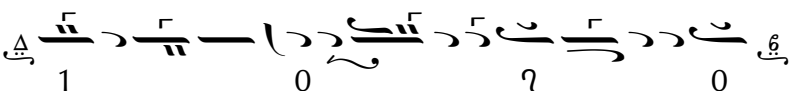
100 

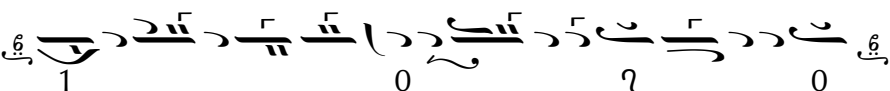
Second Mode - Sticheraric

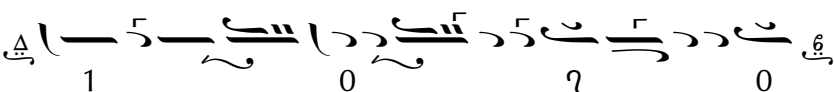
100 

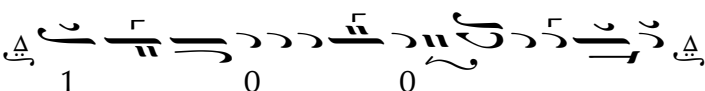
100 

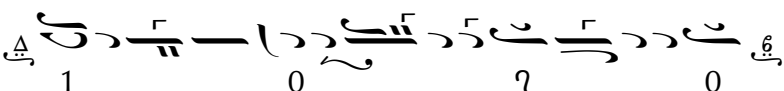
100 

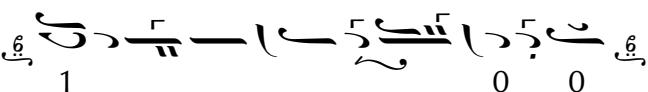
100 

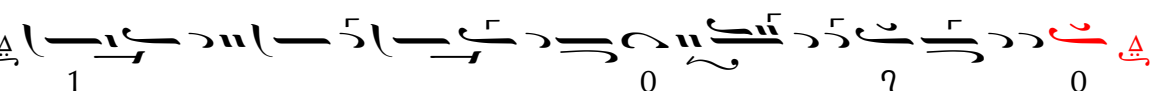
100 

100 

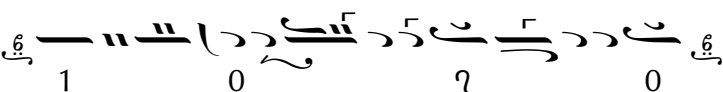
100 

100 

100 

100 





100 

Second Mode - Sticheraric



100 $\frac{A}{1} \frac{B}{0} \frac{C}{2} \frac{D}{0} \frac{E}{A}$

[illegible]

$\frac{1}{2} \frac{1}{2}$
 $\frac{1}{2}$

10X  0 X  X

XOX

0100 $\Delta_0 \rightarrow \Delta_1 \rightarrow \Delta_0 \rightarrow \Delta_2 \rightarrow \Delta_0$

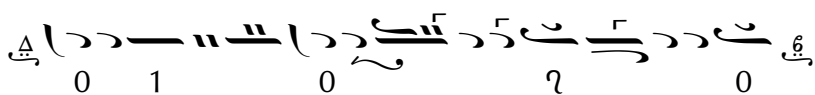
$\frac{1}{2} \frac{1}{2}$

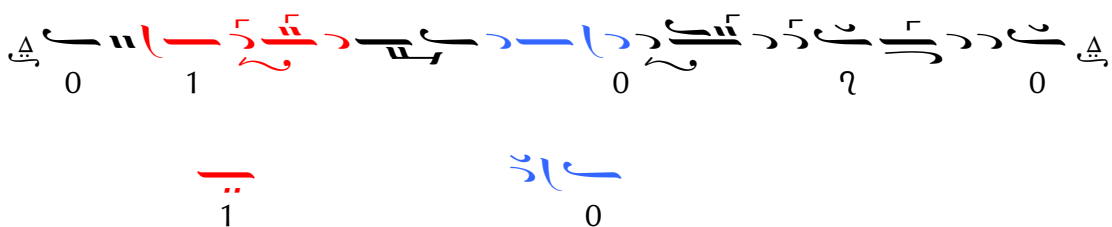
0100 $\underbrace{\text{A}}_0 \text{ " } \underbrace{\text{"}}_1 \text{ " } \text{C} \text{ " } \text{D} \text{ " } \text{E} \text{ " } \text{F} \text{ " } \text{G} \text{ " } \text{H} \text{ " } \text{I} \text{ " } \text{J} \text{ " } \text{K} \text{ " } \text{L} \text{ " } \text{M} \text{ " } \text{N} \text{ " } \text{O} \text{ " } \text{P} \text{ " } \text{Q} \text{ " } \text{R} \text{ " } \text{S} \text{ " } \text{T} \text{ " } \text{U} \text{ " } \text{V} \text{ " } \text{W} \text{ " } \text{X} \text{ " } \text{Y} \text{ " } \text{Z}$

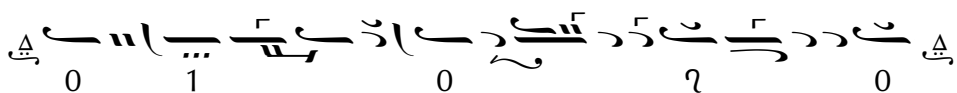
0100 $\underbrace{\quad}_0 \underbrace{\quad}_1 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_2 \underbrace{\quad}_0$ $\underbrace{\quad}_0$

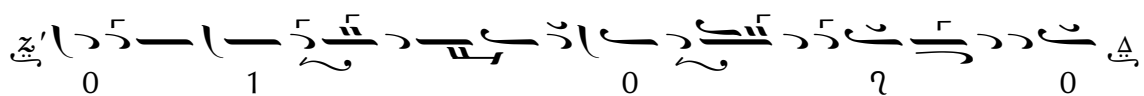
[illegible][illegible]

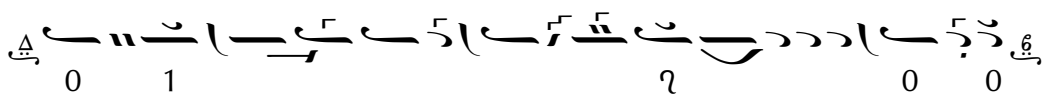
Second Mode - Sticheraric

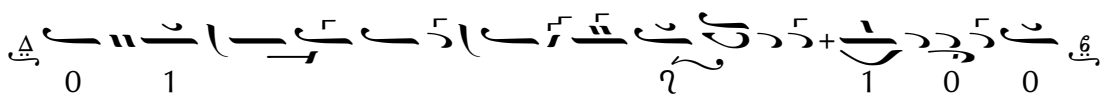
0100 

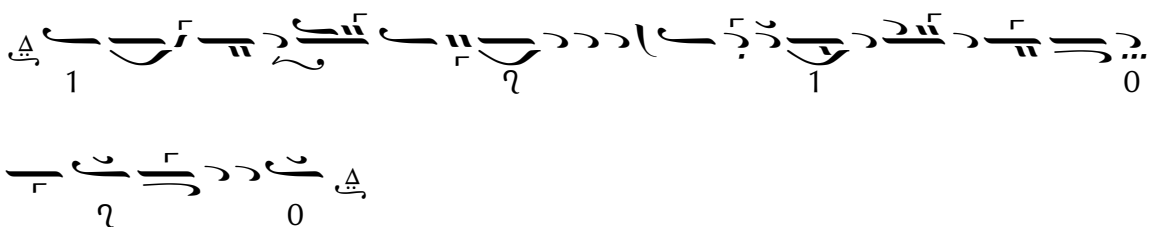
0100 

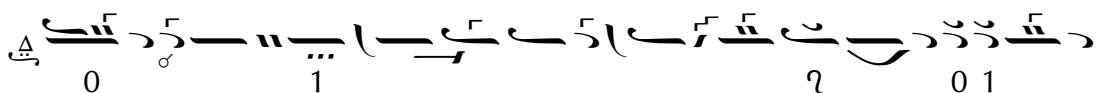
0100 

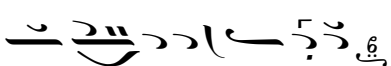
0100 

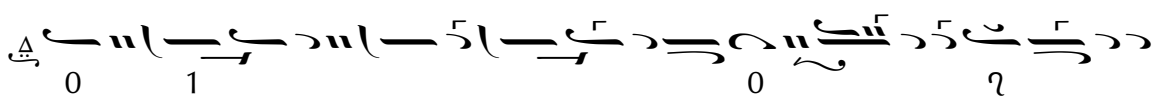
0100 

0100 

1100 

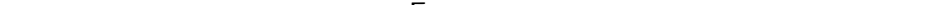
0101 



0101 

Second Mode - Sticheraric

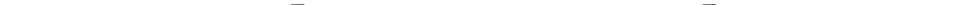
$$1 \quad \int_{\Delta}$$

0101 


[illegible]
$$\frac{1}{\Gamma} \Delta$$
[illegible]

ۛ

$$00100 \quad \begin{array}{c} \text{Diagram 1} \\ 0 \quad 0 \quad 1 \end{array} + \begin{array}{c} \text{Diagram 2} \\ 0 \quad 0 \quad 1 \end{array}$$
$$\frac{d}{dt} \left(\frac{\partial L}{\partial \dot{x}} \right) = \frac{\partial L}{\partial x}$$

00100 

$$\begin{array}{cc} \text{---} & \text{---} \\ 0 & 0 \end{array}$$

00100 

$$00100 \quad \frac{A}{0} - \frac{B}{0} - \frac{C}{1} - \frac{D}{1} - \frac{E}{1} - \frac{F}{1} - \frac{G}{2} - \frac{H}{2} + \frac{I}{1} - \frac{J}{0} - \frac{K}{0} - \frac{L}{6}$$

Second Mode - Sticheraric

00100 Δ $\frac{0}{0} \frac{0}{0} \frac{1}{1} \frac{0}{0} \frac{0}{0} \frac{1}{1}$

$\frac{0}{0} \frac{0}{0} \frac{1}{1} \frac{0}{0} \frac{0}{0}$

Δ

X0100 Δ $\frac{X}{0} \frac{0}{0} \frac{1}{1} \frac{0}{0} \frac{1}{1} \frac{0}{0}$

01100 Δ $\frac{0}{0} \frac{1}{1} \frac{1}{1} \frac{0}{0} \frac{1}{1} \frac{0}{0}$

X0110 Δ $\frac{X}{0} \frac{1}{1} \frac{0}{0} \frac{1}{1} \frac{0}{0} \frac{1}{1}$

$\frac{1}{1} \frac{0}{0}$

010100 Δ $\frac{0}{0} \frac{1}{1} \frac{0}{0} \frac{1}{1} \frac{0}{0} \frac{1}{1}$

$\frac{0}{0} \frac{0}{0}$

100100 Δ $\frac{1}{1} \frac{0}{0} \frac{0}{0} \frac{1}{1} \frac{0}{0}$

$\frac{0}{0}$

100100 Δ $\frac{1}{1} \frac{0}{0} \frac{0}{0} \frac{1}{1} \frac{0}{0} \frac{0}{0}$

$$\begin{array}{c} \text{1} \quad \text{0} \quad \text{0} \\ \text{1} \end{array}$$

$$\begin{array}{c} \text{100100} \\ \text{1} \quad \text{0} \quad \text{0} \quad \text{1} \quad \text{0} \end{array}$$

$$+ \begin{array}{c} \text{1} \quad \text{0} \quad \text{0} \\ \text{1} \end{array}$$

$$\begin{array}{c} \text{100100} \\ \text{1} \quad \text{0} \quad \text{0} \quad \text{1} \quad \text{0} \end{array}$$

$$\begin{array}{c} \text{0} \\ \text{0} \end{array}$$

$$\begin{array}{c} \text{100100} \\ \text{1} \quad \text{0} \quad \text{0} \quad \text{1} \quad \text{0} \quad \text{1} \quad \text{0} \quad \text{0} \quad \text{1} \end{array}$$

$$\begin{array}{c} \text{0} \quad \text{1} \quad \text{0} \quad \text{0} \\ \text{0} \quad \text{0} \end{array}$$

$$\begin{array}{c} \text{01010100} \\ \text{0} \quad \text{1} \quad \text{0} \quad \text{1} \quad \text{0} \quad \text{1} \end{array}$$

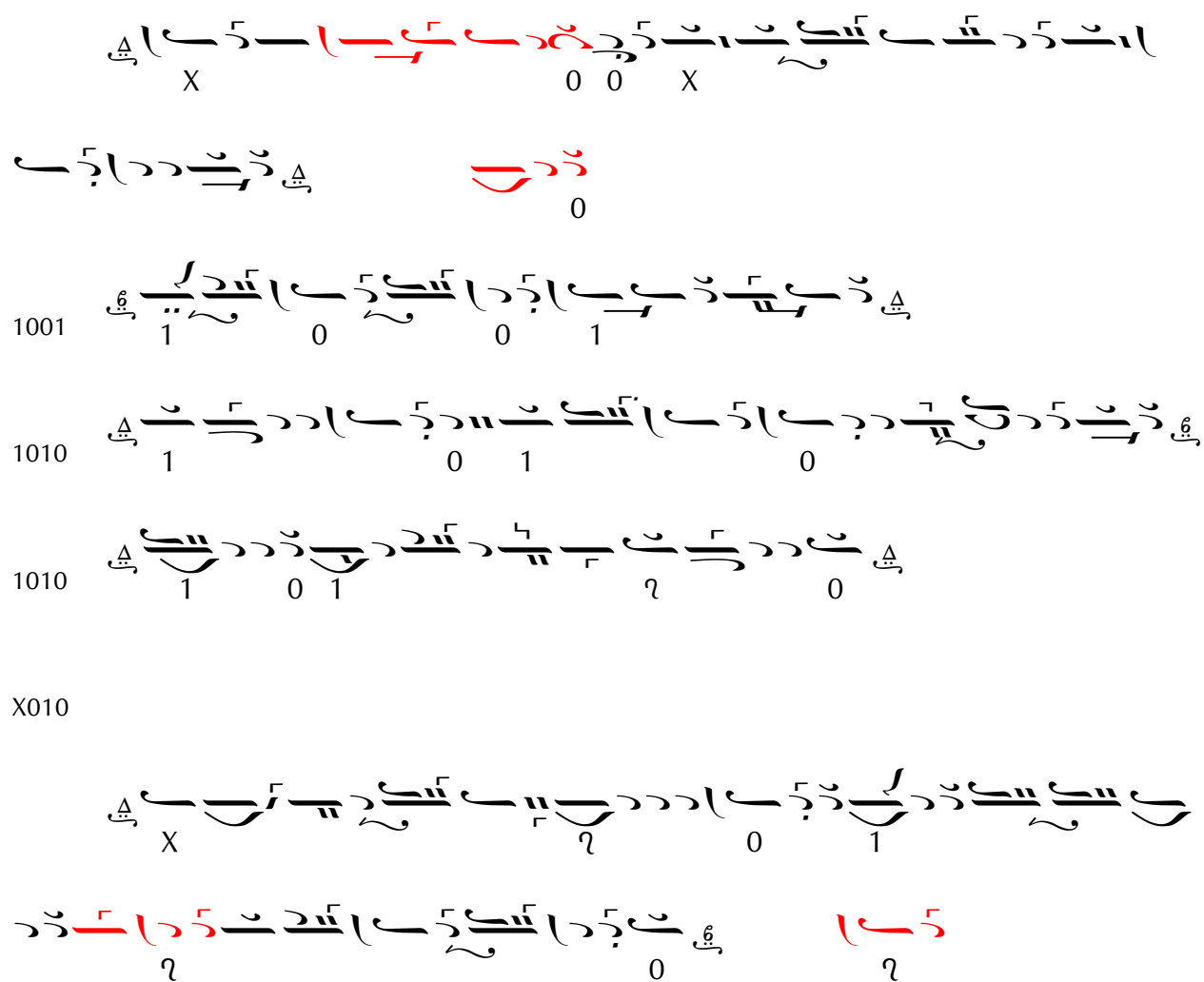
$$\begin{array}{c} \text{0} \quad \text{0} \\ \text{0} \end{array}$$

$$\begin{array}{c} \text{01010100} \\ \text{0} \quad \text{1} \quad \text{0} \quad \text{0} \quad \text{1} \quad \text{0} \quad \text{1} \quad \text{0} \end{array}$$

$$\begin{array}{c} \text{0} \quad \text{0} \quad \text{0} \\ \text{0} \end{array} \quad \begin{array}{c} \text{0} \quad \text{1} \quad \text{0} \end{array}$$

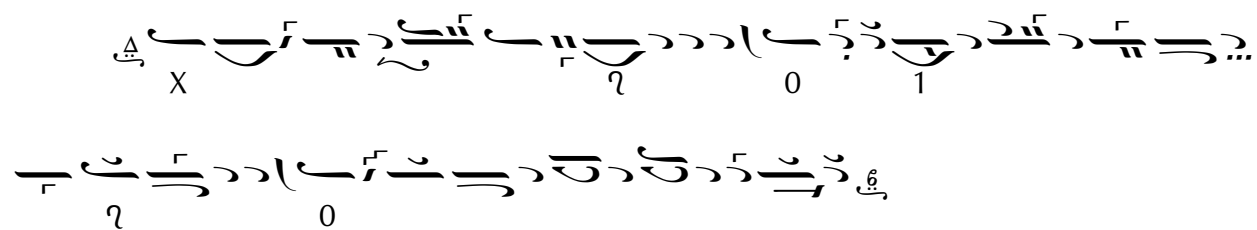
Accented on fourth to last syllable:

X00X

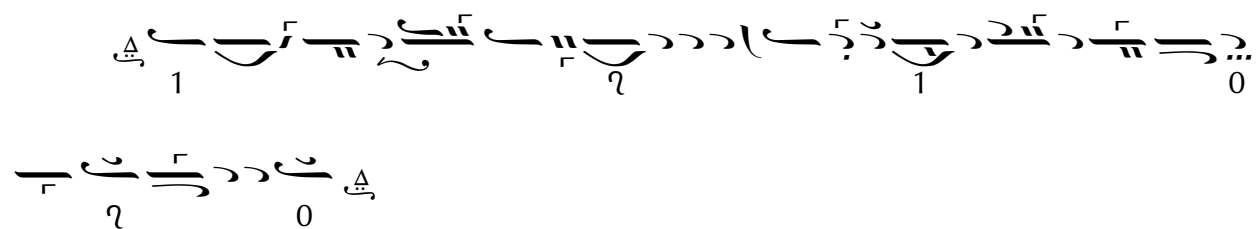


Second Mode - Sticheraric

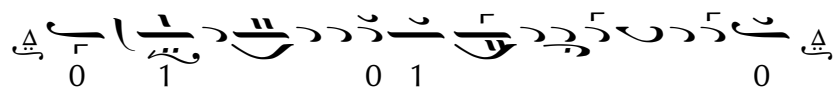
X010



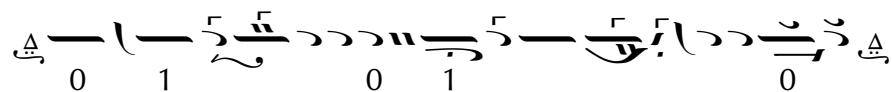
1100



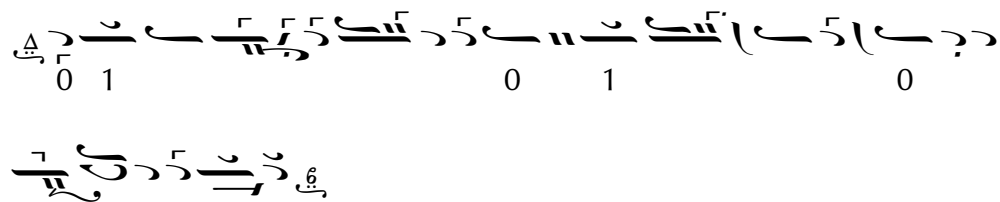
01010



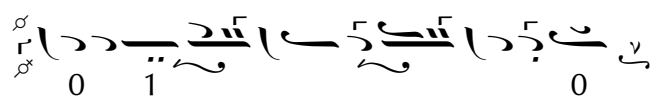
01010

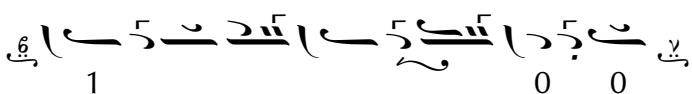


01010

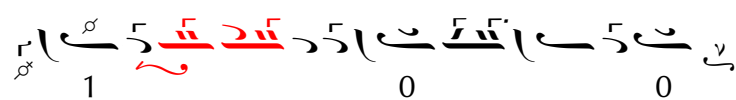


Cadences on Low Nee:

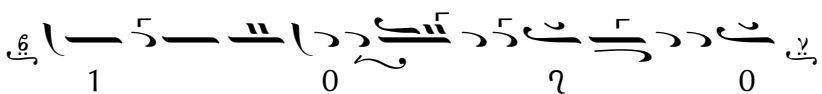
010 

100 

100 

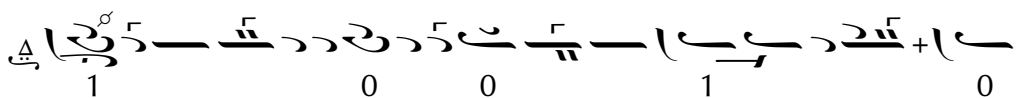
100 

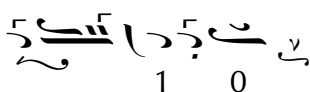


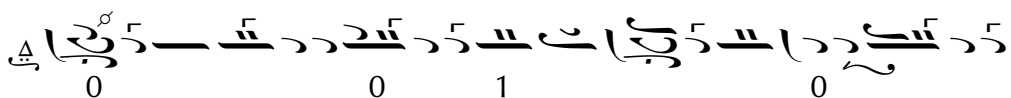
100 

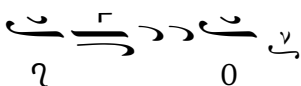
0100 



10010 



00100 



Second Mode - Sticheraric

0100100

J) Ending Formulae

1) Formulae found only near the end:

100

00100

10100

0100100

2) Semi-final Cadences

(to be followed by formulae in next section):

01

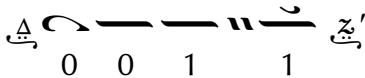
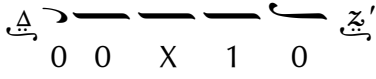

001

010

0001

1001




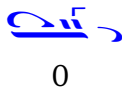

Second Mode - Sticheric

0011	
00X10	
001001	

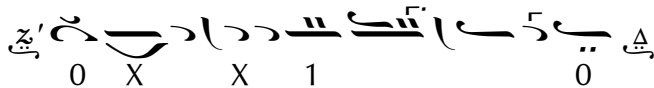
3) Final Cadences

(usually preceded by previous "semi-final" cadences):


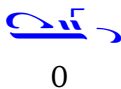


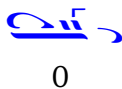

Accented on last syllable:

1X00X		
0X10X		 

Accented on second to last syllable:

0XX10	
-------	--

Accented on third to last syllable:

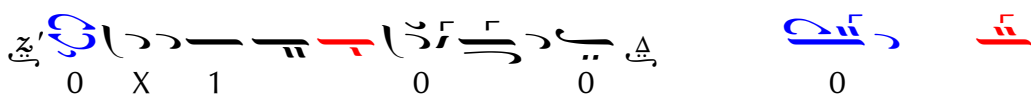
0X10X		 
0X100		 

Second Mode - Sticheraric

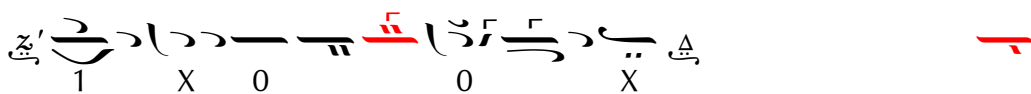
0XX10 

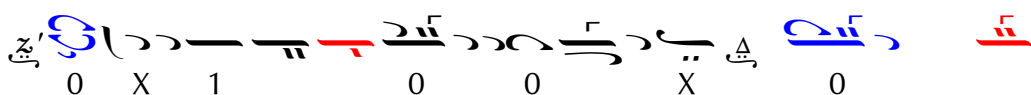
Accented on fourth to last syllable:

0X10X 

0X100 

0XX10 

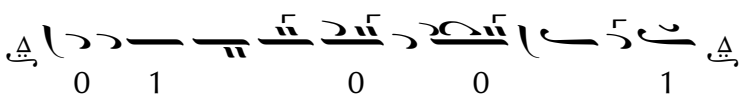
1X00X 

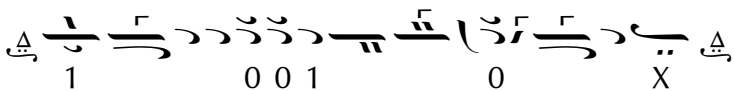
0X100X 


4) Other Final Cadences:

(not preceded by a High Zo "semi-final" cadence):

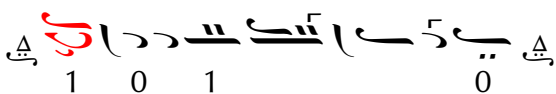

Accented on last syllable:

01001 

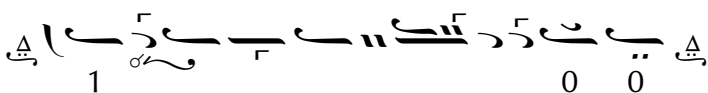
10010X 

1000101 

Accented on second to last syllable:

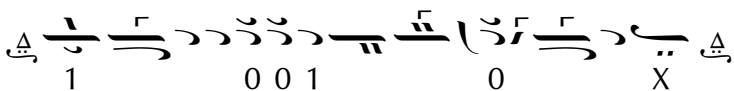
1010  


Accented on third to last syllable:

100 





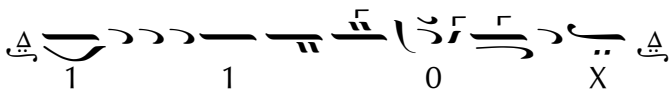


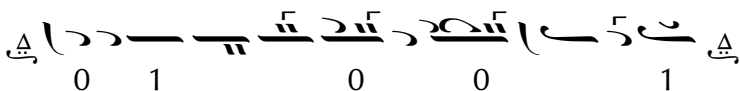
10010X 

1000101 

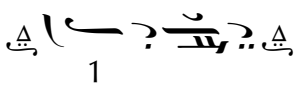
Accented on fourth to last syllable:

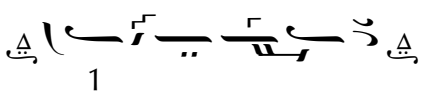
1010  

1100 

01001 

K) Final Cadences for Theotokia

1 

1 

BYZANTINE MUSIC FORMULÆ

Second Mode - Heirmologic (Hard Chromatic)

Contents*

A) Cadences on Pa.....	146
B) Cadences on Di.....	156
C) Formulae with Fthores.....	164
D) Endings for Theotokia	165

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

* The Byzantine music formulae herein were extracted from all the heirmologic melodies found in the Zoe *Anastasimatarion* (14th edition, 2002). Note that in the hard chromatic second mode, the troparia of the Stichera, Aposticha, Anabathmoi, Praises, and the Katanyktika troparia never have medial cadences on Ga. However, the melodies for the canons and the doxology have frequent medial cadences on Ga. Those formulae with cadences on Ga have been omitted from this collection.

A) Cadences on Pa

Accented on last syllable:

From Pa

0 π, — — — π,
 0 0 0

00 π, — — — π,
 0 0

001 π, — — — π,
 0 0 1

0001 π, — — — π,
 0 0 0 1

10001 π, — — — π,
 1 0 0 0 1

010001 π, — — — π,
 0 1 0 0 0 1

100001 π, — — — π,
 1 0 0 0 0 1

0010001 π, — — — π,
 0 1 0 0 0 1

0100001 π, — — — π,
 0 1 0 0 0 0 1

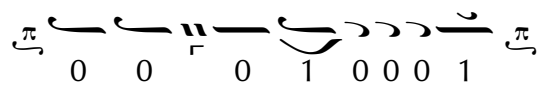
1000101 π, — — — π,
 1 0 0 0 1 0 1

1010001 π, — — — π,
 1 0 1 0 0 0 1

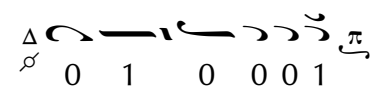
00010001 π, — — — π,
 0 0 1 0 1 0 0 0 1

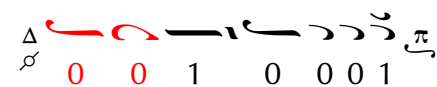
—
0

Second Mode - Heirmologic (Hard Chromatic)

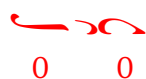
π  π
0 0 0 1 0 0 0 1

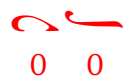
From Di

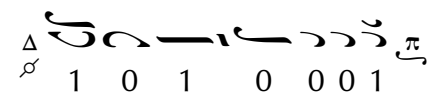
010001 Δ  π
 ρ 0 1 0 0 0 1

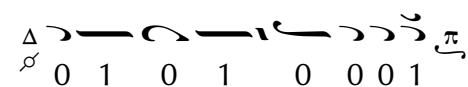
0010001 Δ  π
 ρ 0 0 1 0 0 0 1


0 0


0 0


0 0

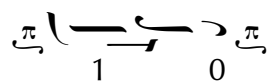
1010001 Δ  π
 ρ 1 0 1 0 0 0 1

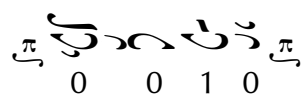
01010001 Δ  π
 ρ 0 1 0 1 0 0 0 1

Accented on second to last syllable:


From Pa

10 π  π
1 0

π  π
1 0

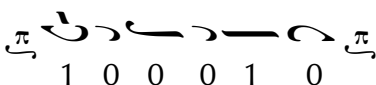
0010 π  π
0 0 1 0

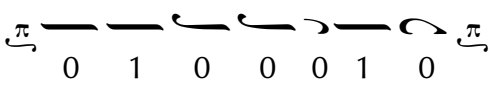
Second Mode - Heirmologic (Hard Chromatic)

10010 

10010 



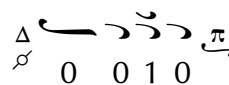
100010 


0100010 

10100010 

From Di

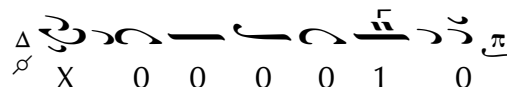
010 

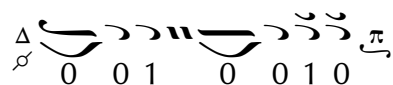
0010 

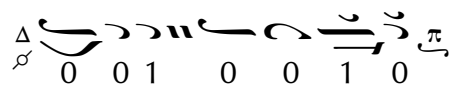
00010 

010010 



X000010 

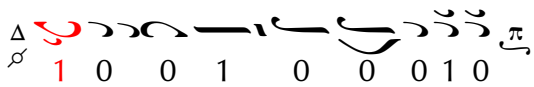

0010010 



Second Mode - Heirmologic (Hard Chromatic)

1000010	Δ 	
100X010	Δ 	
1010010	Δ 	
	Δ 	
X010010	Δ 	
00100010	Δ 	
1000X010	Δ 	
10010010	Δ 	
	Δ 	
1000X010	Δ 	
	Δ 	
1100X010	Δ 	


Second Mode - Heirmologic (Hard Chromatic)

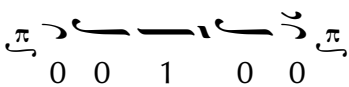
100100010  


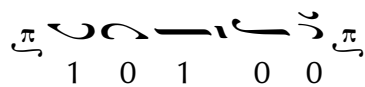
Accented on third to last syllable:

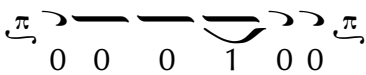
From Pa

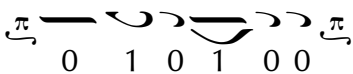
100  

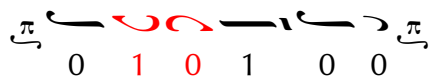

0100 

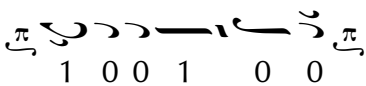
00100 


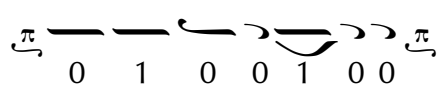
10100  

000100 

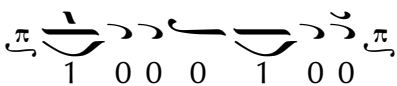
010100 

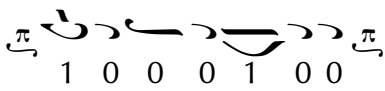
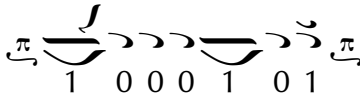
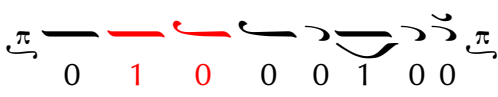
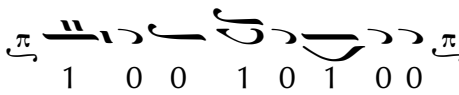
100100 

0100100  

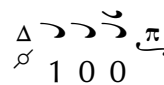


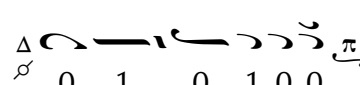
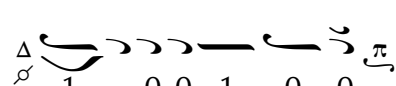
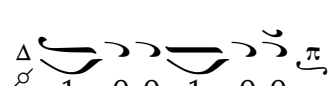


1000100 

Second Mode - Heirmologic (Hard Chromatic)

	π  π
	1 0 0 0 1 0 0
1000101	π  π
	1 0 0 0 1 0 1
01000100	π  π
	0 1 0 0 0 1 0 0
10010100	π  π
	1 0 0 1 0 1 0 0


1 0

From Di

100	Δ  π
	1 0 0
00100	Δ  π
	0 0 1 0 0
000100	Δ  π
	0 0 0 1 0 0
010100	Δ  π
	0 1 0 1 0 0
100100	Δ  π
	1 0 0 1 0 0
	Δ  π
	1 0 0 1 0 0
	Δ  π
	1 0 0 1 0 0
	Δ  π
	1 0 0 1 0 0

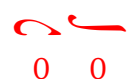
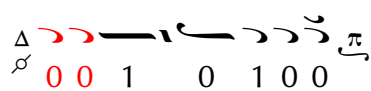
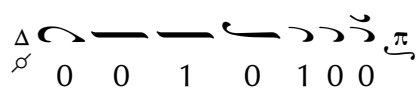

0


0 1

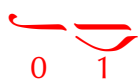
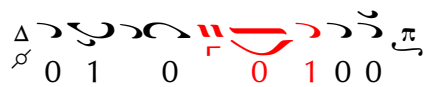
Second Mode - Heirmologic (Hard Chromatic)



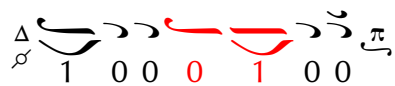
0010100



0100100




1000100

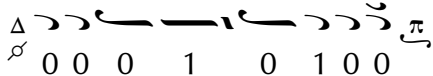


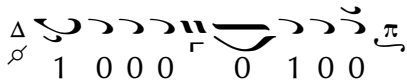
Second Mode - Heirmologic (Hard Chromatic)

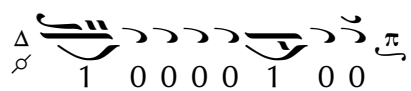
1010100 

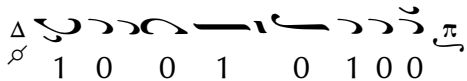
10X0100 

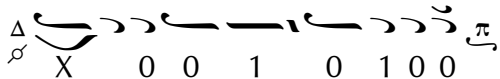


00010100 

10000100 

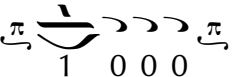


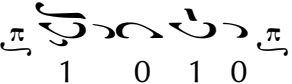
10010100 

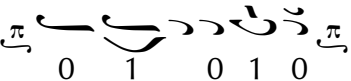
X0010100 

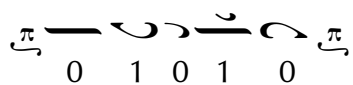
Accented on fourth to last syllable:

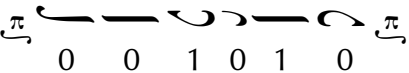
From Pa

1000 

1010 

01010 



001010 

Second Mode - Heirmologic (Hard Chromatic)

0010X0	π π 0 0 1 0 X 0
011010	π π 0 1 1 0 1 0
1001001	π π 1 0 0 1 0 0 1
010101010	π π 0 1 0 1 0 1 0 1 0

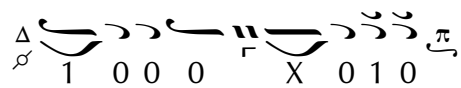
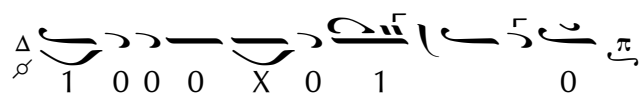
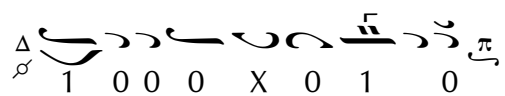
From Di

001001	Δ π ρ 0 0 1 0 0 1
001010	Δ π ρ 0 0 1 0 1 0
0001001	Δ π ρ 0 0 0 1 0 0 1
1001001	Δ π ρ 1 0 0 1 0 0 1
0001010	Δ π ρ 0 0 0 1 0 1 0
1001010	Δ π ρ 1 0 0 1 0 1 0
100X010	Δ π ρ 1 0 0 X 0 1 0
10001001	Δ π ρ 1 0 0 0 1 0 0 1
10X01010	Δ π ρ 1 0 X 0 1 0 1 0

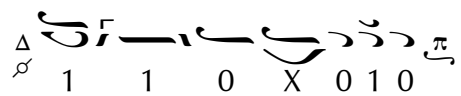
1

Second Mode - Heirmologic (Hard Chromatic)

1000X010



1100X010



B) Cadences on Di

Accented on last syllable:

From Pa

01	$\pi \overbrace{0} \quad \overbrace{1} \quad \Delta$
001	$\pi \overbrace{0} \quad \overbrace{0} \quad \overbrace{1} \quad \Delta$
10001	$\pi \overbrace{1} \quad \overbrace{0} \quad \overbrace{0} \quad \overbrace{0} \quad \overbrace{1} \quad \Delta$
1X0001	$\pi \overbrace{1} \quad \overbrace{X} \quad \overbrace{0} \quad \overbrace{0} \quad \overbrace{0} \quad \overbrace{1} \quad \Delta$
0010001	$\pi \overbrace{0} \quad \overbrace{0} \quad \overbrace{1} \quad \overbrace{0} \quad \overbrace{0} \quad \overbrace{0} \quad \overbrace{1} \quad \Delta$

$\overbrace{1}$

From Di

000	$\Delta \overbrace{0} \quad \overbrace{0} \quad \overbrace{0} \quad \Delta$
01	$\Delta \overbrace{0} \quad \overbrace{1} \quad \Delta$
	$\Delta \overbrace{0} \quad \overbrace{1} \quad \Delta$
001	$\Delta \overbrace{0} \quad \overbrace{0} \quad \overbrace{1} \quad \Delta$
0001	$\Delta \overbrace{0} \quad \overbrace{0} \quad \overbrace{0} \quad \overbrace{1} \quad \Delta$
010001	$\Delta \overbrace{0} \quad \overbrace{1} \quad \overbrace{0} \quad \overbrace{0} \quad \overbrace{0} \quad \overbrace{1} \quad \Delta$

Second Mode - Heirmologic (Hard Chromatic)

	Δ
100001	Δ
0100001	Δ

Accented on second to last syllable:

From Pa

10	Δ 	
	Δ 	
0010	Δ 	
	Δ 	
	Δ 	
X010	Δ 	
10010	Δ 	
	Δ 	
	Δ 	

Second Mode - Heirmologic (Hard Chromatic)

	π		Δ
		1 0 0 1 0	ρ
10X010	π		Δ
		1 0 X 0 1 0	ρ
	π		Δ
		1 0 X 0 1 0	ρ
		1 0	
		1 0	
0010010	π		Δ
		0 0 1 0 0 1 0	ρ
		1 0	
X010010	π		Δ
		X 0 1 0 0 1 0	ρ
1000010	π		Δ
		1 0 0 0 0 1 0	ρ
	π		Δ
		1 0 0 0 1 0	ρ
	π		Δ
		1 0 0 0 0 1 0	ρ
		1 0	

From Di

10	Δ		Δ
	ρ	1 0	ρ
	Δ		Δ
	ρ	1 0	ρ
	Δ		Δ
	ρ	1 0	ρ

Second Mode - Heirmologic (Hard Chromatic)

010

$$\Delta \text{---} 0 \text{---} 1 \text{---} 0 \text{---} \Delta$$

0010

1

$$\Delta \begin{array}{c} \curvearrowright \\ \circlearrowleft \end{array} \quad 0 \quad 0 \quad 1 \quad 0 \quad \Delta \begin{array}{c} \curvearrowright \\ \circlearrowleft \end{array}$$

00010

$$\begin{array}{ccccccccc} \Delta & & & & & & & & \Delta \\ \nearrow & & \curvearrowright & \text{---} & \curvearrowleft & & & & \nwarrow \\ 0 & 0 & 0 & 1 & 0 & & & & \end{array}$$

10010

$$\Delta \quad \begin{array}{c} \text{1} \\ \text{0} \\ \text{0} \\ \text{1} \\ \text{0} \end{array} \quad \Delta$$
$$\Delta \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \Delta$$

000010

$$\Delta_{\emptyset} \quad \text{hook} \quad \text{hook} \quad \text{hook} \quad \text{hook} \quad \text{hook} \quad \Delta_{\emptyset}$$

$$0 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0$$

010010

$$\begin{array}{ccccccc} \Delta & \curvearrowright & \curvearrowright & \text{---} & \text{---} & \text{=} & \curvearrowleft \\ \nearrow & 0 & 1 & 0 & 0 & 1 & 0 \searrow \\ \nearrow & & & & & & \searrow \end{array}$$

0100010

$$\begin{array}{ccccccc} \Delta & \curvearrowright & \curvearrowright & \curvearrowright & \text{---} & \text{---} & \text{=} & \text{=} & \Delta \\ \varnothing & 0 & 1 & 0 & 0 & 0 & 1 & 0 & \varnothing \end{array}$$

01000010

Diagram illustrating a 1D chain with 8 sites. The sites are labeled 0 to 7. The chain is represented by a sequence of horizontal lines. Sites 1 and 8 are occupied by spin-1/2 particles (Δ with a circle). Sites 2-7 are occupied by spin-1 particles (double horizontal lines). Site 6 has a red double underline. Site 7 has a red arrow pointing right.

1 0

Accented on third to last syllable:

From Pa

100

$$\pi \left(\frac{1}{1} \right) = \frac{0}{0} \Delta$$
[illegible]

Second Mode - Heirmologic (Hard Chromatic)

$\int_{\pi} \overbrace{1}^{\Delta} \underbrace{00}_{\rho}$

$\int_{\pi} \overbrace{1}^{\Delta} \underbrace{00}_{\rho}$

$\overbrace{0}^{\Delta}$

$\int_{\pi} \overbrace{1}^{\Delta} \underbrace{00}_{\rho}$

$\int_{\pi} \overbrace{1}^{\Delta} \underbrace{00}_{\rho}$

00100

$\int_{\pi} \overbrace{00}^{\Delta} \underbrace{100}_{\rho}$

$\int_{\pi} \overbrace{00}^{\Delta} \underbrace{100}_{\rho}$

$\int_{\pi} \overbrace{00}^{\Delta} \underbrace{100}_{\rho}$

$\int_{\pi} \overbrace{00}^{\Delta} \underbrace{100}_{\rho}$

$\int_{\pi} \overbrace{00}^{\Delta} \underbrace{100}_{\rho}$

10100

$\int_{\pi} \overbrace{10}^{\Delta} \underbrace{100}_{\rho}$

100100

$\int_{\pi} \overbrace{10}^{\Delta} \underbrace{00100}_{\rho}$

$\int_{\pi} \overbrace{10}^{\Delta} \underbrace{00100}_{\rho}$

$\int_{\pi} \overbrace{10}^{\Delta} \underbrace{00100}_{\rho}$

00X0100

$\int_{\pi} \overbrace{00}^{\Delta} \underbrace{X0100}_{\rho}$

Second Mode - Heirmologic (Hard Chromatic)

1000100

From Di

100

0100

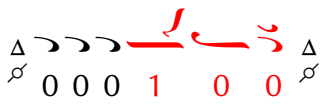
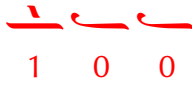
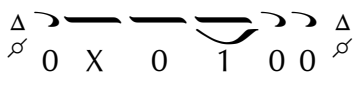
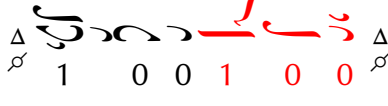
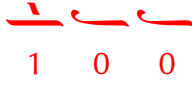
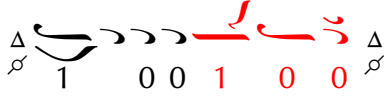
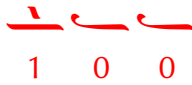
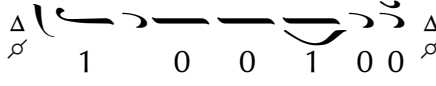

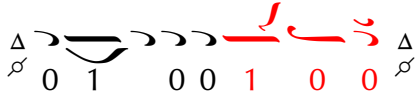
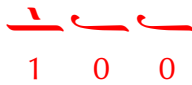
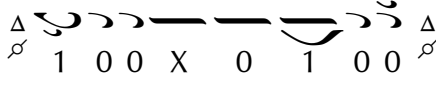
0101

00100

10100

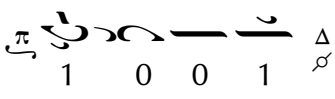
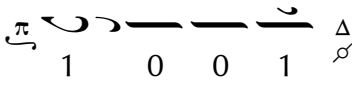
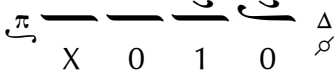
1

Second Mode - Heirmologic (Hard Chromatic)

000100		
0X0100		
100100		
		
		
0100100		
		
100X0100		

Accented on fourth to last syllable:

From Pa

1001	
	
X010	

Second Mode - Heirmologic (Hard Chromatic)

11001		
001001		
10X010		

From Di

1000		
1001		
01001		
01010		

C) Formulae with Fthores

01001

$$\pi \overbrace{\quad}^{\varphi} \rightarrow \overbrace{\quad}^{\Gamma} \quad \quad \quad \overbrace{\quad}^{\varphi} \pi$$

0 1 0 0 1

010001

$$\pi \overbrace{\quad}^{\varphi} \rightarrow \overbrace{\quad}^{\varphi} \quad \quad \quad \overbrace{\quad}^{\varphi} \pi$$

1 0 0 0 1

D) Endings for Theotokia*

Accented on last syllable:

(Use a formula ending in 100)

Accented on second to last syllable:

100010 


1X0010 

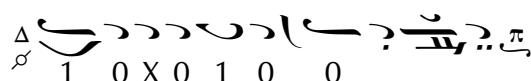
Accented on third to last syllable:

0X0100 

100100 



10X0100 



* The formulae in blue in this section are from the Athonite oral tradition, as represented in the book *Παρακλητική, Μουσικὸν Ἐγκόλπιον, Πλάγιοι Ἦχοι, Ἱεροθέου Ἱερομονάχου, ἐκδόσεις Ἱ.Μ. Φιλοθέου, Ἁγίου Ὄρους, 2004.*

BYZANTINE MUSIC FORMULAE

Second Mode - Heirmologic (Soft Chromatic)

Contents*

A) Initial Formulae	168
B) Cadences on Vou	170
C) Cadences on Di	171
D) Cadences on Zo.....	180
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F) Final Cadences	182
G) Endings for Theotokia	183

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

* The Byzantine music formulae herein were extracted from all the heirmologic melodies found in the *Zoe Anastasimatarion* (14th edition, 2002), all the heirmologic melodies in the *Neon Anastasimatarion* by Petros Ephesios, some melodies of Vol. I of the *Doxastarion* by Petros Peloponnesios (and Keltzanides), and all the heirmologic melodies in Vol. I of *Mousike Kypsele*. These formulae are applicable to Apolytikia, Kontakia, and Kathismata in (soft chromatic) second mode. Bear in mind that all Apolytikia and Kontakia in plagal second mode (except for the Apolytikion of the Resurrection) do not use formulae of plagal second mode but these formulae in second mode. The formulae applicable to the verses of Psalms 140, 141, and 129 chanted in the beginning of Vespers are at: <http://www.stanthonysmonastery.org/music/Formula2v.pdf>

A) Initial Formulae

Accented on last syllable:

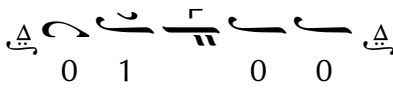
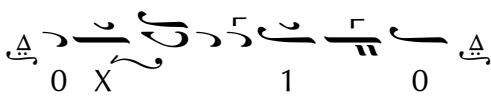
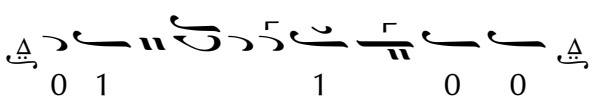
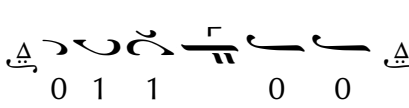
00001		
00010001		

Accented on second to last syllable:

10		
010		
0010		
0X10		
00010		
10010		
0000010		

Accented on third to last syllable:

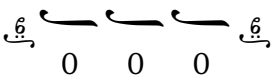
Second Mode - Heirmologic (Soft Chromatic)

0100	
0X10	
01100	
	

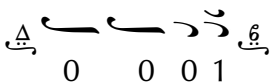
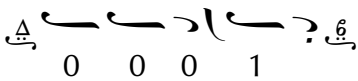
B) Cadences on Vou

Accented on last syllable:

From Vou



000 

From Di

0001 


Accented on second to last syllable:

From Di

10  

Accented on third to last syllable:

From Di

0100  
000100100  

Accented on fourth to last syllable:

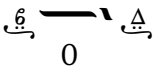
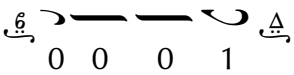
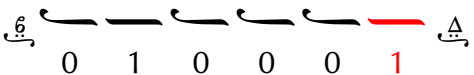

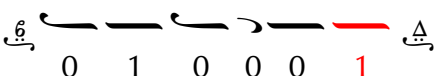



From Di

01001  

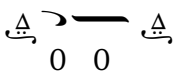
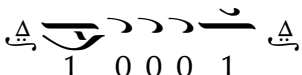
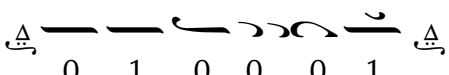
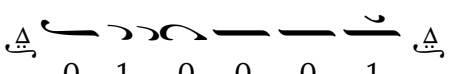
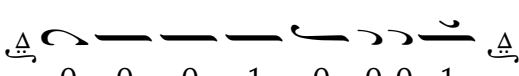
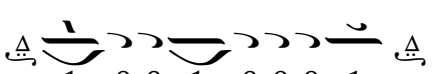
C) Cadences on Di

Accented on last syllable:

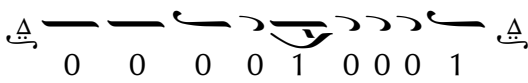
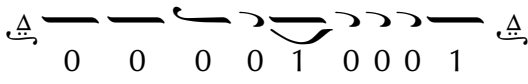

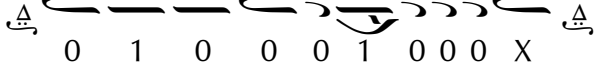
From Vou

0		
0001		
010001		
		
00100001		

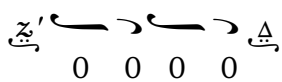
From Di

00		
10001		
010001		
		
00010001		
10010001		

Second Mode - Heirmologic (Soft Chromatic)

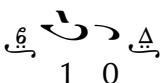
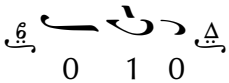
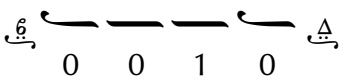
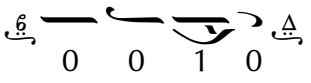
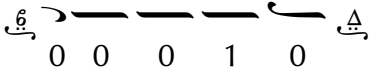
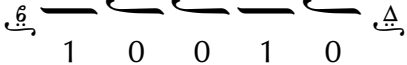
000010001	
	
010100001	
010001000X	

From Zo

0000	
------	---

Accented on second to last syllable:

From Vou

10	
010	
0010	
	
00010	
10010	

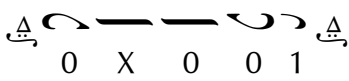
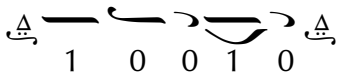
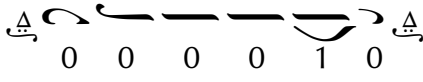
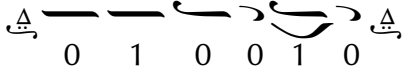
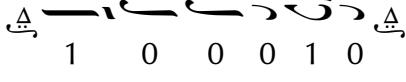
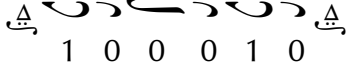
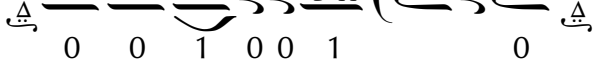
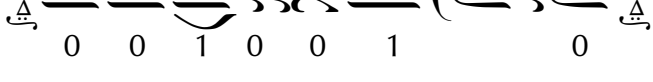
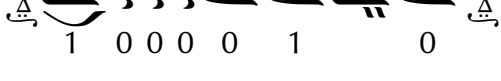
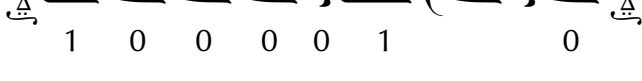
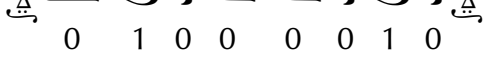
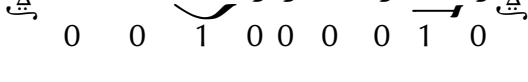
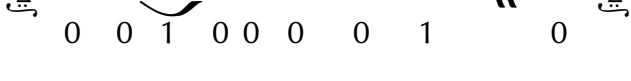
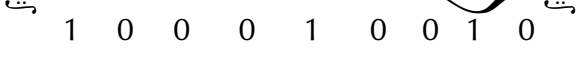
Second Mode - Heirmologic (Soft Chromatic)

010010	
0100010	
001000010	
010010010	
101000010	
010001000010	

From Di


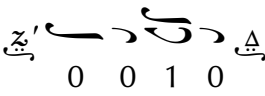
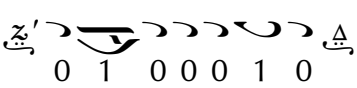
10	
0010	
00010	

Second Mode - Heirmologic (Soft Chromatic)

0X010	
10010	
000010	
010010	
100010	
	
0010010	
	
1000010	
	
01000010	
001000010	
	
100010010	

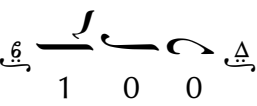
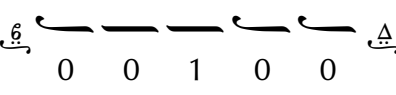

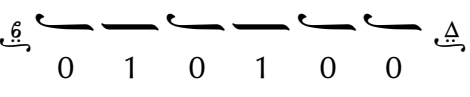
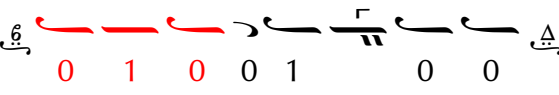

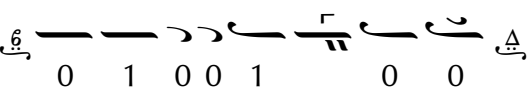
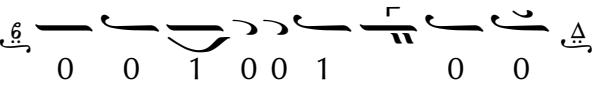
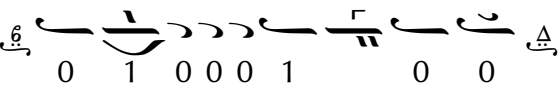
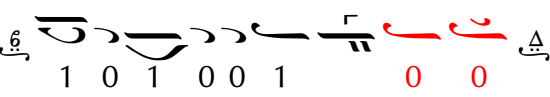

Second Mode - Heirmologic (Soft Chromatic)

From Zo

10	
0010	
0100010	

Accented on third to last syllable:

From Vou

100		
00100		
010100		
		
0100100		
		
00100100		
01000100		
10100100		

Second Mode - Heirmologic (Soft Chromatic)

010000100

0100100100

01000100100

01001000100

01010000100

01000100100100

From Di

100

0100

Second Mode - Heirmologic (Soft Chromatic)

$\Delta \text{ — } \text{ — } \text{ — } \text{ — } \Delta$
0 1 0 0

$\Delta \text{ — } \text{ — } \text{ — } \text{ — } \Delta$
0 1 0 0

00100

$\Delta \text{ — } \text{ — } \text{ — } \text{ — } \Delta$
0 0 1 0 0

$\Delta \text{ — } \text{ — } \text{ — } \text{ — } \Delta$
0 0 1 0 0

10100

$\Delta \text{ — } \text{ — } \text{ — } \text{ — } \Delta$
1 0 1 0 0

000100

$\Delta \text{ — } \text{ — } \text{ — } \text{ — } \Delta$
0 0 0 1 0 0

010100

$\Delta \text{ — } \text{ — } \text{ — } \text{ — } \Delta$
0 1 0 1 0 0

$\Delta \text{ — } \text{ — } \text{ — } \text{ — } \Delta$
0 1 0 1 0 0

100100

$\Delta \text{ — } \text{ — } \text{ — } \text{ — } \Delta$
1 0 0 1 0 0

$\Delta \text{ — } \text{ — } \text{ — } \text{ — } \Delta$
1 0 0 1 0 0

$\Delta \text{ — } \text{ — } \text{ — } \text{ — } \Delta$
1 0 0 1 0 0

$\Delta \text{ — } \text{ — } \text{ — } \text{ — } \Delta$
1 0 0 1 0 0

0100100

$\Delta \text{ — } \text{ — } \text{ — } \text{ — } \Delta$
0 1 0 0 1 0 0

$\Delta \text{ — } \text{ — } \text{ — } \text{ — } \Delta$
0 1 0 0 1 0 0

Second Mode - Heirmologic (Soft Chromatic)

0000100

$$1000100 \quad \begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ & 1 & 0 & 0 & 0 & 1 & 00 \end{array}$$
$$\begin{array}{ccccccc} \triangle & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \triangle \\ 1 & & 0 & & 0 & & 0 & & 1 & & 0 & & 0 \end{array}$$

1 0 0 0

$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ 1 & 0 & 0 & 0 & 1 & 0 & 0 \end{array}$$

1 0 0

$$\begin{array}{ccccccc} \triangle & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \triangle \\ 1 & 0 & 0 & 0 & 1 & 0 & 0 \end{array}$$

01000100

0 1 0 0 0 1 0 0

10000100 Δ 1 0 0 0 0 1 0 0 Δ

1 0 0

01010010X

0 1 0 1 0 0 1 0 X

1

Accented on fourth to last syllable:

From Vou

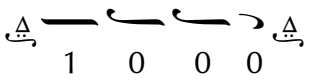
01001001001

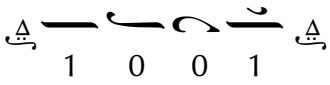
$\overbrace{01001001001}^{\text{6}} \quad \overbrace{01001001001}^{\text{A}}$

1

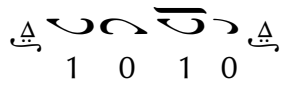
Second Mode - Heirmologic (Soft Chromatic)

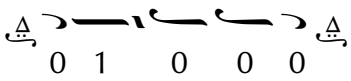
From Di

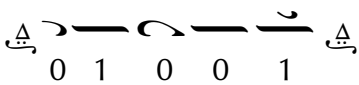
1000 

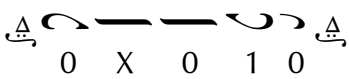
1001 


1010 

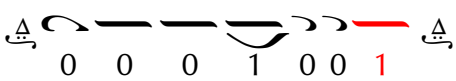



01000 

01001 

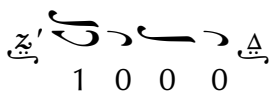
0X010 

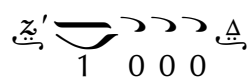
001000 

0001001 

10001001 

From Zo

1000 





D) Cadences on Zo

Accented on second to last syllable:

From Di

10 $\frac{\Delta}{1} \text{---} \frac{1}{0} \frac{\Delta'}{2}$

From Zo

X00010

X 0 0 0 1 0

Accented on third to last syllable:

From You

100

From Di

$$0100 \quad \underbrace{\underbrace{A}_0} \quad \underbrace{}_1 \quad \underbrace{}_0 \quad \underbrace{}_0 \quad \underbrace{}_{z'}$$
$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & & \Sigma' \\ & 0 & 1 & 0 & 0 & & \end{array}$$

E) Formulae with Fthoras

00100

$$\begin{array}{ccccccccc} \Delta & \rightarrow & \text{---} & \curvearrowright & \rightarrow & \rightarrow & \rightarrow & \rightarrow & \rightarrow \\ 0 & 0 & & 1 & 0 & 0 & & & \rightarrow^x \end{array}$$

$$\begin{array}{ccccccccc} \Delta & \rightarrow & \text{---} & \text{---} & \rightarrow & \rightarrow & \rightarrow & \rightarrow & \rightarrow \\ 0 & 0 & & 1 & 0 & 0 & & & \rightarrow^x \end{array}$$


F) Final Cadences

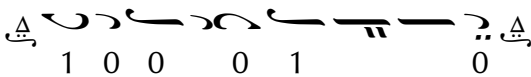
Accented on last syllable:

A 100 formula may be used here


Accented on second to last syllable:

10010 


100010 

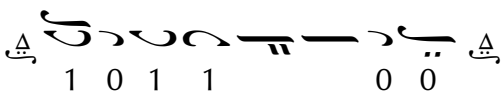


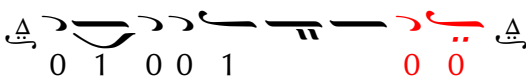
Accented on third to last syllable:

00100 

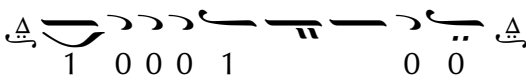
10100 

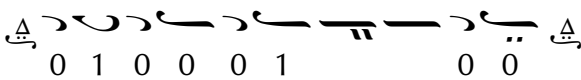
010100 

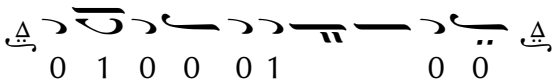
101100 

0100100 

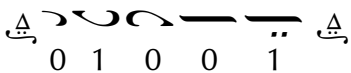


1000100 

01000100 



Accented on fourth to last syllable:

01001 

G) Endings for Theotokia*

10X		
010X		
0010X		

* The two formulae in blue in this section are from the Athonite oral tradition, as represented in the book *Παρακλητική, Μουσικὸν Ἐγκόλπιον, Πλάγιοι Ἦχοι*, Ἱεροθέου Ἱερομονάχου, ἐκδόσεις Ἱ.Μ. Φιλοθέου, Ἅγιον Ὄρος, 2004.

BYZANTINE MUSIC FORMULAE

Second Mode - Verses (Soft Chromatic)

Contents*

A) Cadences on Zo	184
B) Cadences on Di.....	188
C) Formulae with Fthoras.....	194
D) Final Cadences	195

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
accented or unaccented

Variations of the same formula
are indicated in color

* The Byzantine music formulae herein were extracted from all the heirmologic verses found in the *Zoe Anastasimatarion* (14th edition, 2002), the *Anastasimatarion* of Petros Peloponnesios (Mousike Bibliotheke), the *Neon Anastasimatarion* by Petros Ephesios, and the doxology by Ioannis Kavvadas (as found in Vol. II of *Mousikos Pandektes*). These formulae are applicable only to the brief verses (that are not immediately followed by troparia) of Psalms 140, 141, and 129 chanted in the beginning of Vespers immediately after "Lord I Have Cried" and the brief verses of Psalms 148, 149, and 150 chanted in Orthros immediately after "Let Every Breath." They may also be used for composing a brief doxology. The soft chromatic formulae in second mode used for Apolytikia, Kontakia, and Kathismata are at:

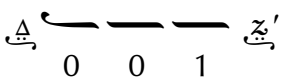
<http://www.stanthonysmonastery.org/music/Formula2s.pdf>

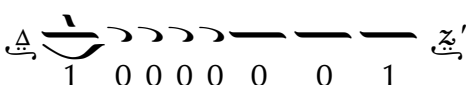
A) Cadences on Zo

These formulae are also used as initial formulae.

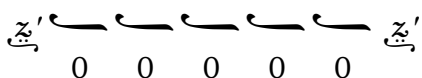
Accented on last syllable:

From Di

001 

10000001 

From Zo

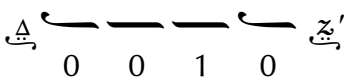
00000 

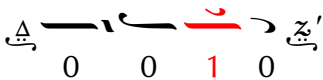

Accented on second to last syllable:

From Di

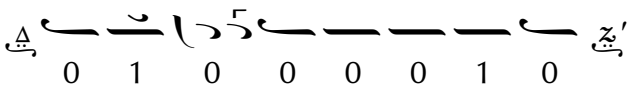
10 

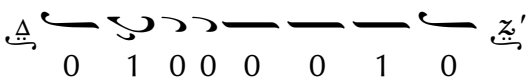
010 

0010 

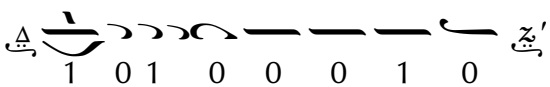
 

00X10 

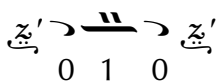
01000010 

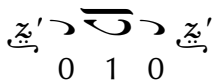


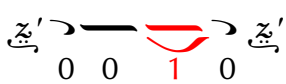
Second Mode - Verses (Soft Chromatic)

10100010 

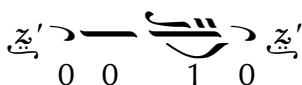
From Zo

010 



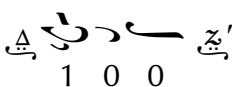
0010 

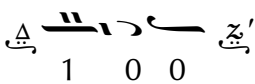


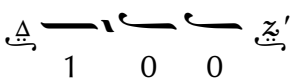


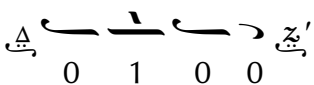
Accented on third to last syllable:

From Di

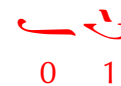
100 

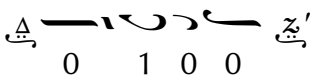


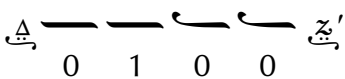


0100 

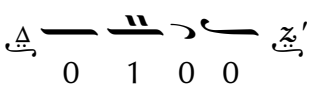
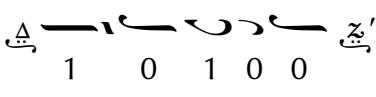
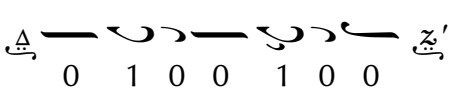
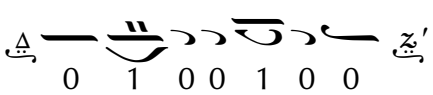




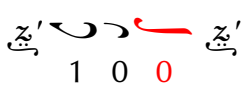

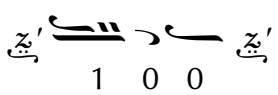
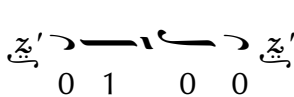





Second Mode - Verses (Soft Chromatic)

	
	
10100	
	
X0100	
0100100	
	

From Zo

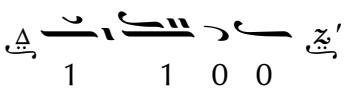
100		
		
0100		
100100		

Accented on fourth to last syllable:

From Di

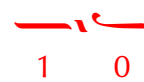
1001		
------	---	---

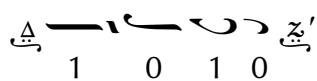
Second Mode - Verses (Soft Chromatic)

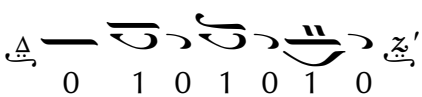
1100 


X010 

1010 





0101010 



From Zo

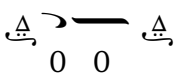
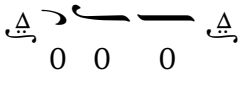
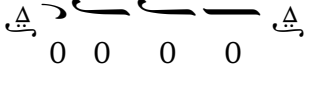
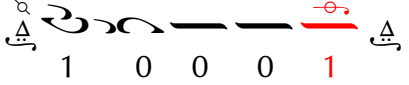
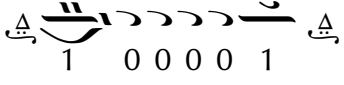
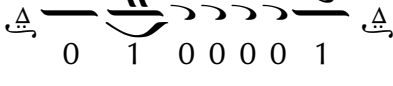


1010 



B) Cadences on Di

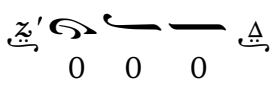
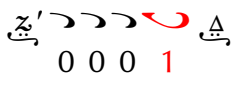
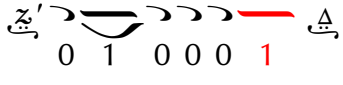
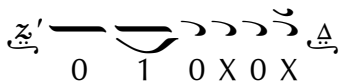
Accented on last syllable:

From Di

00	
000	
0000	
10001	
100001	
0100001	
01010001	
10010001	



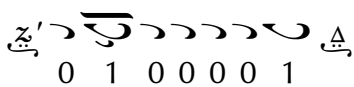
From Zo

000	
0001	
010001	
010X0X	





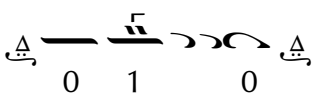
Second Mode - Verses (Soft Chromatic)

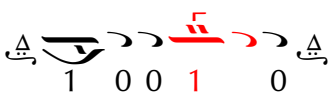
0100001 

Accented on second to last syllable:

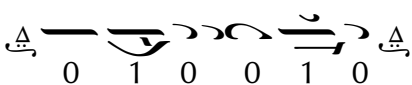
From Di

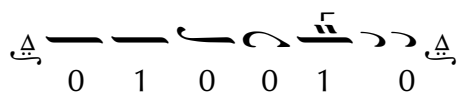
10 

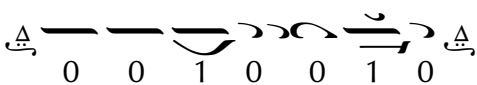
010 

10010 



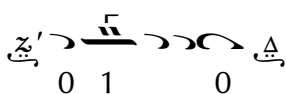
010010 

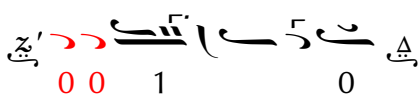


0010010 


100X010 

From Zo

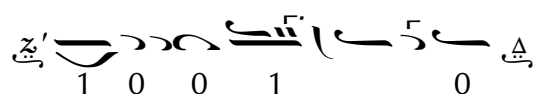
010 

0010 



10010 





Second Mode - Verses (Soft Chromatic)

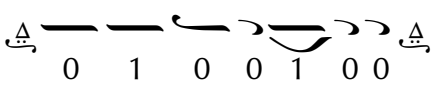
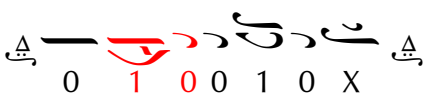
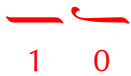

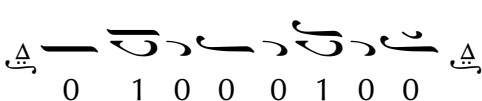
010X010		

Accented on third to last syllable:





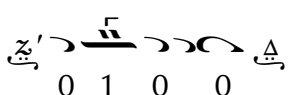
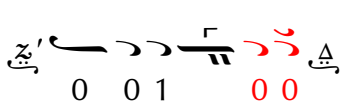

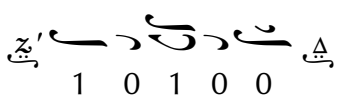

From Di

100		
0100		
10100		
011100		
100100		
0000100		
0100100		

Second Mode - Verses (Soft Chromatic)

		
010010X		
0110X00		
001000100		

From Zo

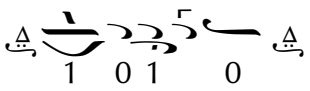
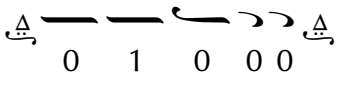
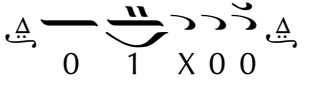
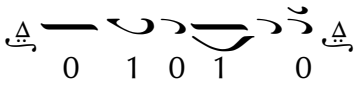
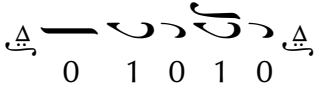
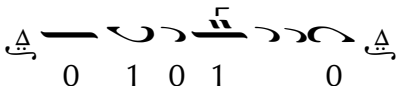


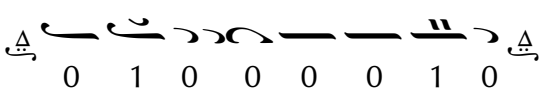
100		
0100		
		
		
00100		
10100		
100100		

Accented on fourth to last syllable:

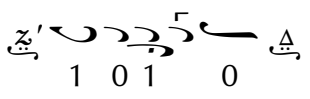
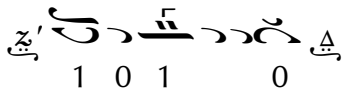
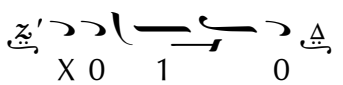
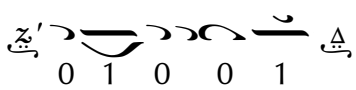
From Di

1001	
------	---

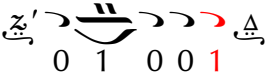

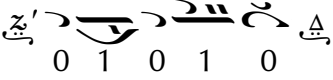


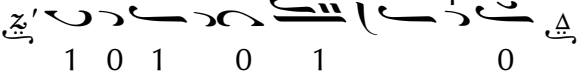
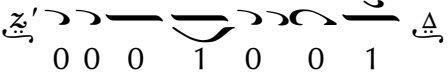



Second Mode - Verses (Soft Chromatic)

1010	
01000	
01X00	
01010	
	
	
001000	
0101010	
01001010	

From Zo

1010	
	
X010	
01001	

Second Mode - Verses (Soft Chromatic)

		
01010		
		
001010		
101010		
0001001		
0101010		
1001010		

C) Formulae with Fthoras

Accented on last syllable:

From Di

001 Δ $\overline{0}$ $\overline{0}$ $\overline{1}$ γ'

From Zo

0010100

0 0 1 0 1 0 0

Accented on second to last syllable:

From Di

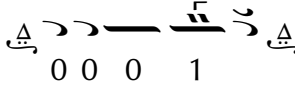
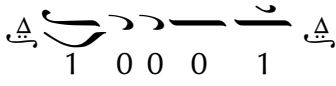
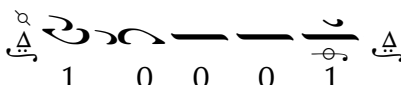
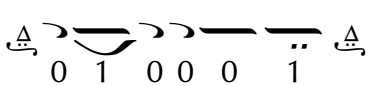
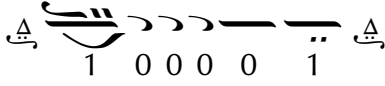
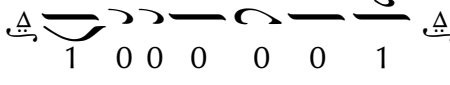
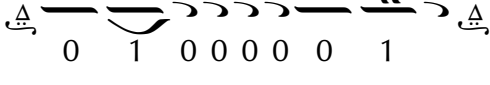
0010 $\begin{array}{cccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} \\ \downarrow & & & & \downarrow \\ 0 & 0 & 1 & 0 & \gamma \otimes \end{array}$

1000010

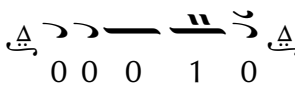
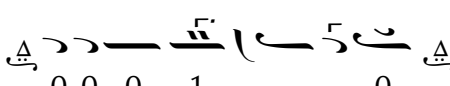
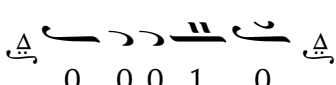
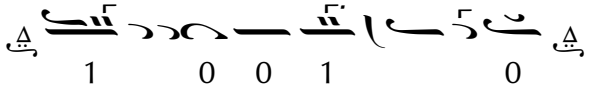
1 0 0 0 0 1 0

D) Final Cadences

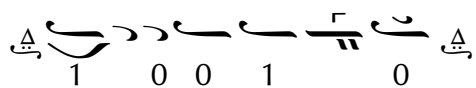
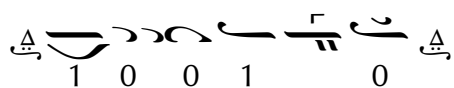
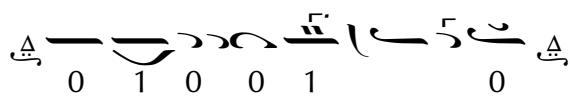
Accented on last syllable:

0001	
10001	
	
010001	
100001	
1000001	
01000001	

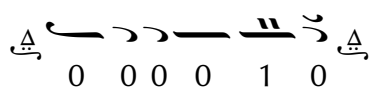
Accented on second to last syllable:

00010	
	
	
10010	

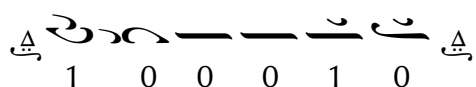
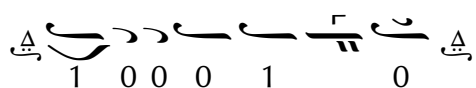
Second Mode - Verses (Soft Chromatic)



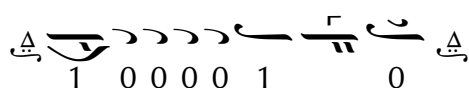
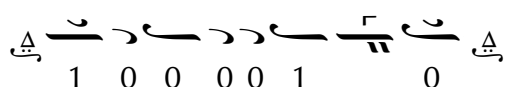
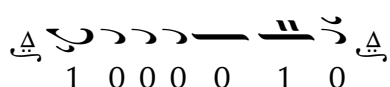
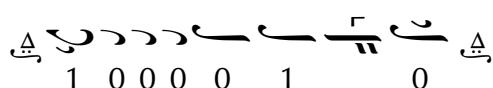
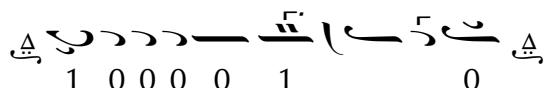
000010



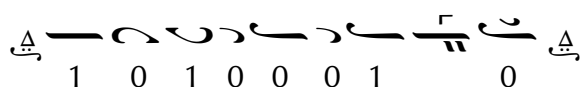
100010



1000010




10100010



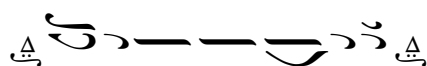
Second Mode - Verses (Soft Chromatic)

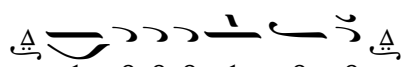
Accented on third to last syllable:

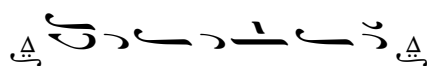
0010100 
0 0 1 0 1 0 0

1000100 
1 0 0 0 1 0 0


0 0



1 0 0 0 1 0 0


1 0 0 0 1 0 0

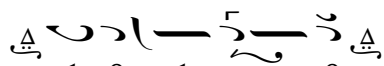
1010100 
1 0 1 0 1 0 0

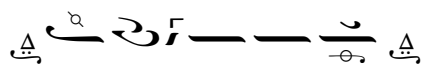
1100100 
1 1 0 0 1 0 0



1 1 0 0 1 0 0

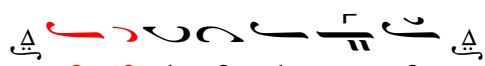
0000100 
0 0 0 0 1 0 0

Accented on fourth to last syllable:

1010 
1 0 1 0

01001 
0 1 0 0 1


0 1 0 0 1

001010 
0 0 1 0 1 0


0 0

Second Mode - Verses (Soft Chromatic)

00X010 Δ $\overbrace{\quad\quad\quad}^{\quad}$ $\overbrace{\quad\quad\quad}^{\quad}$ $\overbrace{\quad\quad\quad}^{\quad}$ $\overbrace{\quad\quad\quad}^{\quad}$ $\overbrace{\quad\quad\quad}^{\quad}$ Δ
 0 0 X 0 1 0

101010 Δ $\overbrace{\quad\quad\quad}^{\quad}$ $\overbrace{\quad\quad\quad}^{\quad}$ $\overbrace{\quad\quad\quad}^{\quad}$ $\overbrace{\quad\quad\quad}^{\quad}$ $\overbrace{\quad\quad\quad}^{\quad}$ $\overbrace{\quad\quad\quad}^{\quad}$ Δ
 1 0 1 0 1 0



Third Mode



BYZANTINE MUSIC FORMULAE

Third Mode - Sticheraric

Contents*

<u>Initial Formulae</u>	
A) Ga (or Pa) - Ke.....	202
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2) Pa - Di.....	215
3) Pa - Pa.....	218
4) Di - Ke.....	219
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6) Pa - Ga.....	221
7) Di - Ga.....	222
8) Ga - Ke.....	223
9) Di - Di.....	224
10) Di - Pa.....	225
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<u>Other Formulae</u>	
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* The Byzantine music formulae herein were extracted from sticheraric melodies found in the *Zoe Anastasi-matarion* (14th edition, 2002) Volume I of *Mousike Kypsele* (1883 edition), the *Doxastarion* of Konstantinos Protopsaltis (1844 edition), and the two-volume *Athonias* (1906 edition) by Petros Philanthidis.

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

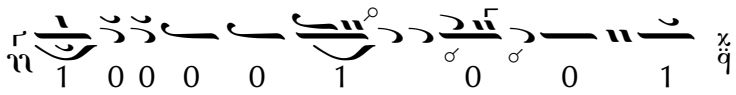
A) Intial Formulae Ga - Ke

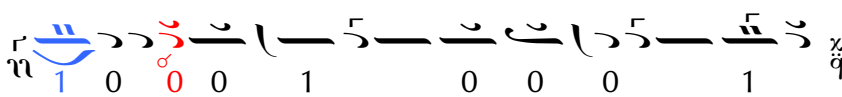
These may also be used as medial formulae from Pa to Ke by increasing the intervallic jump of the first character by two.


Accented on last syllable:

1001			
10001			
X0001			
100001			
010001			
1000101			
1001001			
10010001			

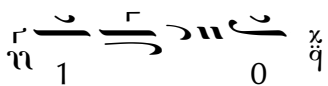
Third Mode - Sticheraric

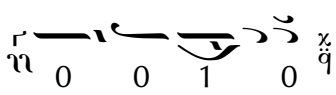
100001001 

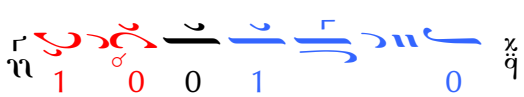
100010001 




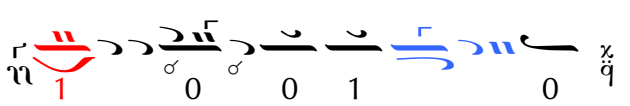
Accented on second to last syllable:


10 

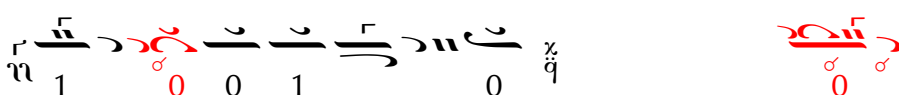
0010 

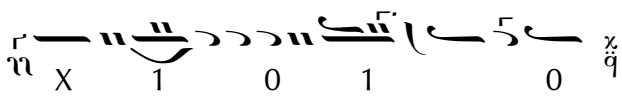
10010 




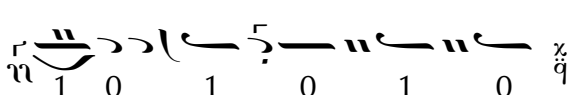




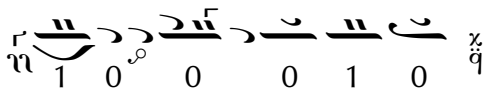


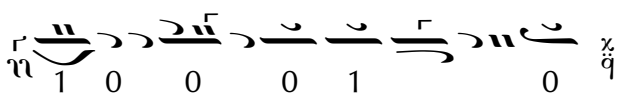
X1010 

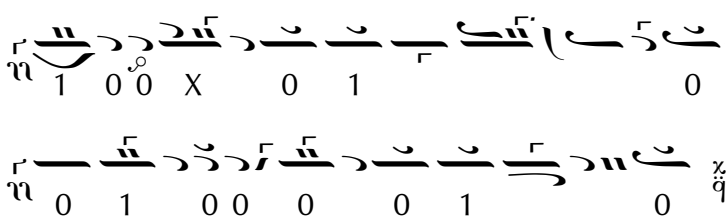
100110 

101010 

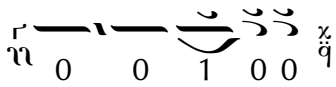
Third Mode - Sticheraric

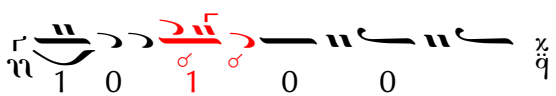
100010 

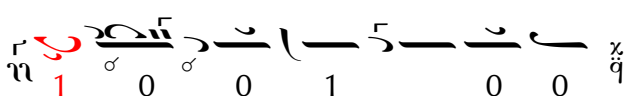
100X010 

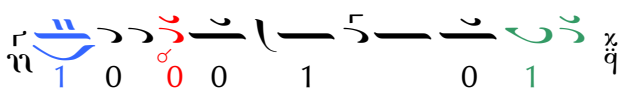
01000010 


Accented on third to last syllable:

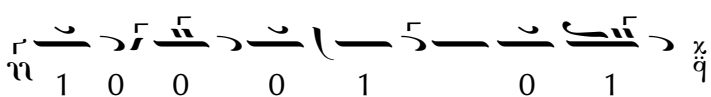
00100 

10100 

100100 

1000101 

1000101 

1000101 

Third Mode - Sticheraric

1000100

1 0 0 0 1 0 0

00100100

0 0 1 0 0 1 0 0

010100100

0 1 0 1 0 0 1 0 0

010010100

0 1 00 1 0 1 0 0

010000100

0 1 00 0 0 0 1 0 0

100100100

1 0 0 1 0 0 0 1 0 0

1 00 0 1 0 0 1 0 0 1 0 0

Accented on fourth to last syllable:

1001

1 0 0 1

X1010

X 1 0 1 0

101010

1 0 1 0 1 0

100X010

1 00 X 0 1 0

B) Medial Formulae Ke - Pa

Accented on last syllable:

1010X	
0X0001	
10010X	
100X0X	
X00X0X	
0X00001	
01X0X01	
X0X010X	
100010X	

Third Mode - Sticheraric

1000X0X

10X01001

0X000001

X010000X

Accented on second to last syllable:

0010

010010

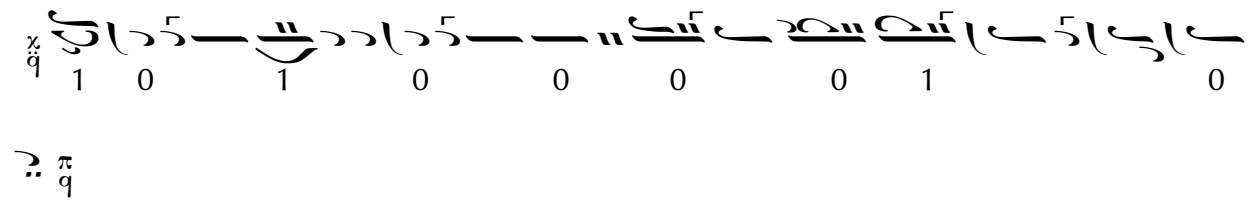
100010

0000010

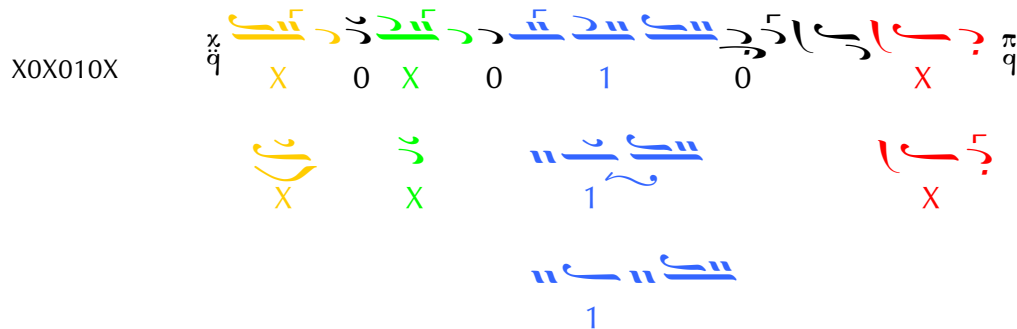
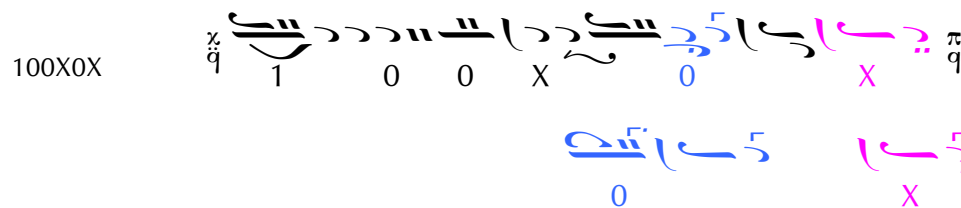
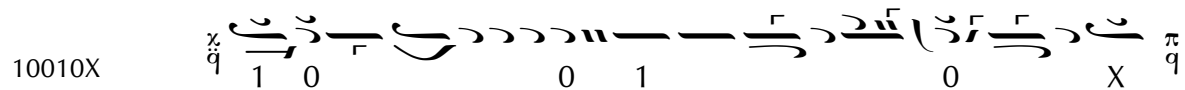
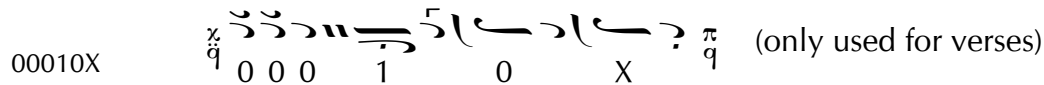
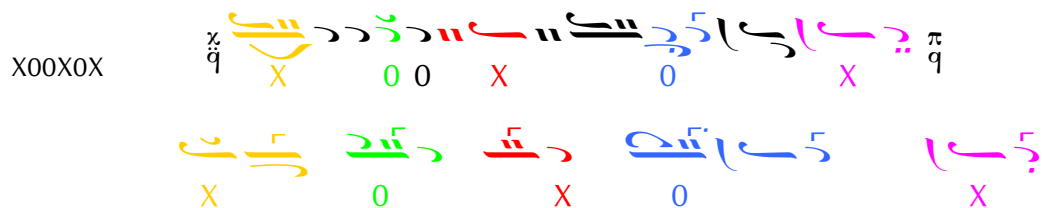
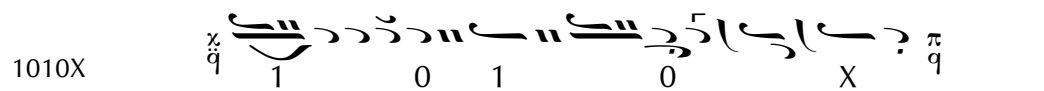
0100010

Third Mode - Sticheraric

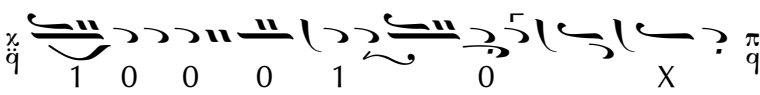
101000010

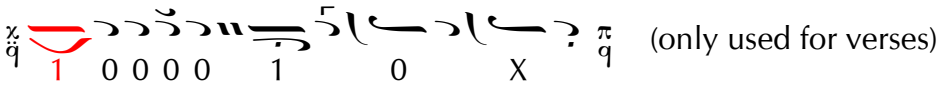



Accented on third to last syllable:

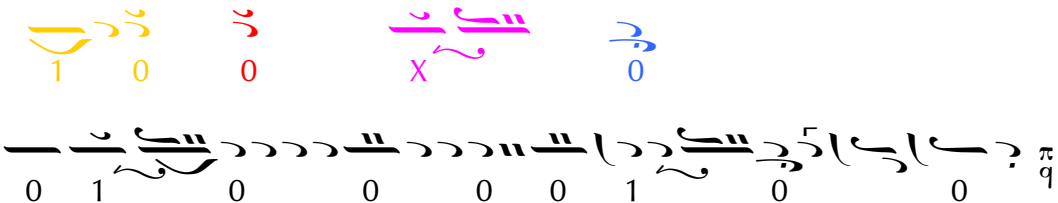


Third Mode - Sticheraric

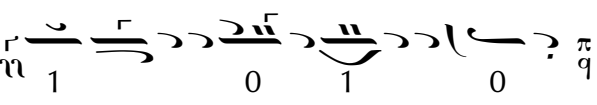
100010X 

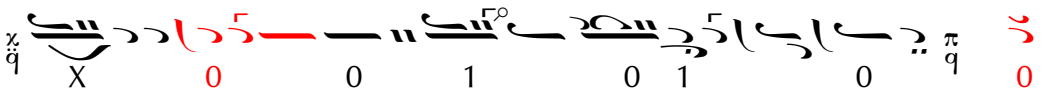
100010X  (only used for verses)

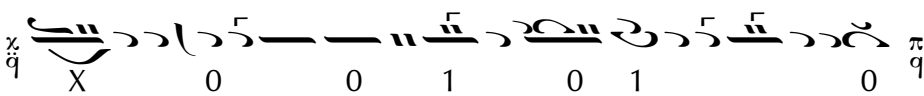
1000X0X 


010000100 

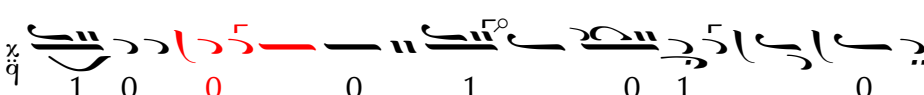
Accented on fourth to last syllable:

1010 

X001010 

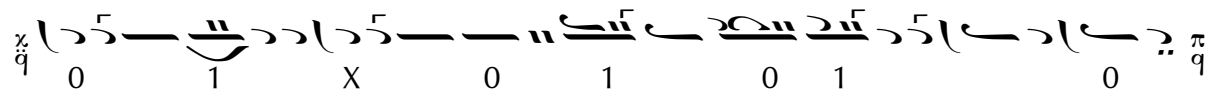
01001010 

10001010 

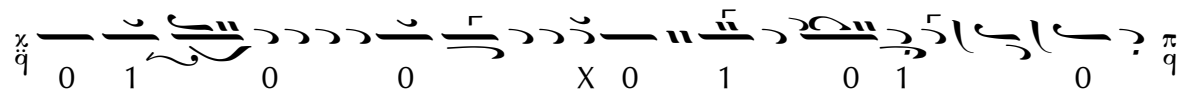
10101001 

Third Mode - Sticheraric

01X01010



0100X01010



C) Medial Formulae from Pa

In third mode there are four ways that the melody continues from Pa: by having a cadence on Nee, Ga, Di, or Ke. The cadences on Ke may be preceded by a cadence on Di. The cadences on Nee must be preceded by a cadence on Di. The cadences on Ga and Di are not written with a martyria. Interestingly enough, the vast majority of heirmologic bridges in third mode occur as medial formulae from Pa. For this reason, there is no separate section for such bridges in this mode.

1) Pa - Ke

Note that some formulae in section A may also be used as formulae from Pa to Ke.

Accented on last syllable:

[illegible]

Accented on second to last syllable:

010 π_q $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{q}$

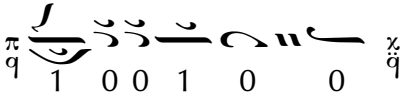
Third Mode - Sticheraric

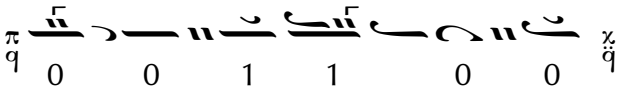
	$\pi_q \frac{1}{0} \text{ " } \frac{\text{u}}{1} \text{ } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{q}$
0010	$\pi_q \frac{\text{u}}{0} \frac{\text{u}}{0} \frac{\text{u}}{1} \text{ } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{q}$
	$\pi_q \frac{\text{u}}{0} \text{ } \frac{\text{u}}{0} \frac{\text{u}}{1} \text{ } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{q}$
	$\pi_q \frac{\text{u}}{0} \frac{\text{u}}{0} \frac{\text{u}}{1} \text{ " } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{q}$
	$\pi_q \frac{\text{u}}{0} \text{ } \frac{\text{u}}{0} \frac{\text{u}}{1} \text{ } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{q}$
	$\pi_q \frac{\text{u}}{0} \text{ } \frac{\text{u}}{0} \frac{\text{u}}{1} \text{ } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{q}$
00010	$\pi_q \frac{1}{0} \frac{\text{u}}{0} \frac{\text{u}}{0} \frac{\text{u}}{1} \text{ } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{q}$
	$\pi_q \frac{\text{u}}{0} \frac{\text{u}}{0} \frac{\text{u}}{0} \frac{\text{u}}{1} \text{ } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{q}$
110010	$\pi_q \frac{\text{u}}{1} \text{ } \frac{\text{u}}{1} \text{ } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{1} \text{ } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{q}$

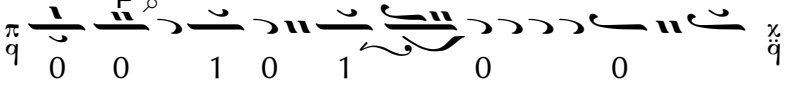
Accented on third to last syllable:

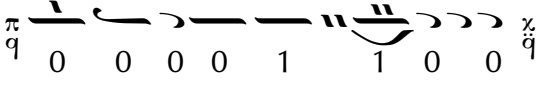
100	$\pi_q \frac{\text{u}}{1} \text{ } \frac{\text{u}}{0} \frac{\text{u}}{0} \text{ } \frac{\text{u}}{q}$
00100	$\pi_q \frac{\text{u}}{0} \frac{\text{u}}{0} \frac{\text{u}}{1} \text{ } \frac{\text{u}}{0} \frac{\text{u}}{0} \text{ } \frac{\text{u}}{q}$
	$\pi_q \frac{\text{u}}{0} \frac{\text{u}}{0} \frac{\text{u}}{1} \text{ } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{q}$
10100	$\pi_q \frac{1}{1} \frac{\text{u}}{0} \frac{\text{u}}{1} \text{ } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{0} \text{ } \frac{\text{u}}{q}$

Third Mode - Sticheraric


100100 π_q  $\frac{x}{q}$

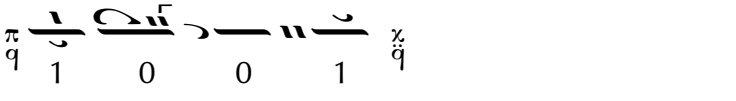
001100 π_q  $\frac{x}{q}$

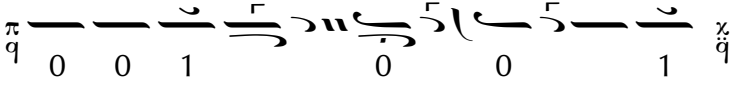
0010100 π_q  $\frac{x}{q}$

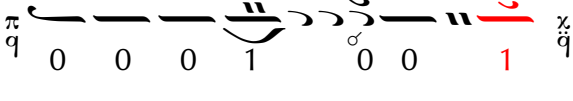
00001100 π_q  $\frac{x}{q}$

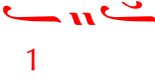
Accented on fourth to last syllable:

1001 π_q  $\frac{x}{q}$

001001 π_q  $\frac{x}{q}$

0001001 π_q  $\frac{x}{q}$

0001001 π_q  $\frac{x}{q}$

 $\frac{x}{q}$

2) Pa - Di

These formulae are followed by a cadence on Ke (section C4) or Nee (section C5) or Ga (section C7) or Pa (section C10) or by another cadence of Di (section C9).

Accented on last syllable:

01 π_q $\overline{}$ $\overline{}$ $\Delta_{\mathfrak{A}}$

$$X_1 \quad \pi_q \quad \frac{1}{X} \quad \frac{1}{\mathfrak{A}} \quad \frac{\Delta}{\mathfrak{A}}$$
$$001 \quad \pi_q \quad \overline{0} \quad \overline{0} \quad \overline{1} \quad \Delta_{\mathfrak{A}}$$

10001

π_q
 $\xrightarrow{1}$
 $\xrightarrow{0}$
 $\xrightarrow{0}$
 $\xrightarrow{0}$
 $\xrightarrow{1}$
 $\xrightarrow{\Delta}$

[illegible]

Accented on second to last syllable:


$$010 \quad \pi_q \frac{1}{0} \frac{1}{1} \frac{1}{0} \frac{1}{\Delta}$$
$$\pi_q \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \text{---} \\ 1 \end{array} \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \Delta \\ \text{---} \\ \text{---} \end{array}$$
$$0010 \quad \overset{\pi}{q} \begin{array}{cccc} \text{---} & \text{---} & \text{=} & \text{~} \\ 0 & 0 & 1 & 0 \end{array} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$$
$$\begin{array}{ccccccc} \pi & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ q & 0 & 0 & 1 & 0 & 0 & \end{array}$$
$$\pi_q \frac{1}{0} - \frac{1}{0} - \frac{1}{1} \rightarrow \rightarrow \rightarrow \frac{1}{0} \Delta$$
$$\pi_q \begin{array}{cccc} \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 0 & 1 & 0 \end{array} \Delta_{\mathfrak{A}}$$

Third Mode - Stichleraric


$\pi_q \frac{\text{---}}{0} \frac{\text{---}}{0} \frac{\text{---}}{1} \frac{\text{---}}{0} \frac{\Delta}{\mathfrak{A}}$
 00010
 $\pi_q \frac{\text{---}}{0} \frac{\text{---}}{0} \frac{\text{---}}{0} \frac{\text{---}}{1} \frac{\text{---}}{0} \frac{\Delta}{\mathfrak{A}}$
 10010
 $\pi_q \frac{\text{---}}{1} \frac{\text{---}}{0} \frac{\text{---}}{0} \frac{\text{---}}{1} \frac{\text{---}}{0} \frac{\Delta}{\mathfrak{A}}$
 010010
 $\pi_q \frac{\text{---}}{0} \frac{\text{---}}{0} \frac{\text{---}}{1} \frac{\text{---}}{0} \frac{\text{---}}{1} \frac{\text{---}}{0} \frac{\Delta}{\mathfrak{A}}$
 001010
 $\pi_q \frac{\text{---}}{0} \frac{\text{---}}{0} \frac{\text{---}}{0} \frac{\text{---}}{X} \frac{\text{---}}{1} \frac{\text{---}}{0} \frac{\Delta}{\mathfrak{A}}$
 000X10

Accented on third to last syllable:


100

π_q 


0100

π_q 

0101

π_q 

00100

π_q 

0 1

Third Mode - Sticheraric

10100

π_q $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{\Delta}$

000100

π_q $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{\Delta}$


0100100


π_q $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{\Delta}$


0010100

π_q $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{\Delta}$

Accented on fourth to last syllable:

1001 π_q  Δ

001010 π_q  Δ

1001010 π_q  Δ

3) Pa - Pa

10010 π_q $\frac{1}{0}$ $\frac{0}{1}$ $\frac{0}{1}$ $\frac{1}{0}$ π_q

0010010 π_q $\frac{\text{---}}{0}$ $\frac{\text{---}}{0}$ $\frac{\text{---}}{1}$ $\frac{\text{---}}{0}$ $\frac{\text{---}}{0}$ $\frac{\text{---}}{1}$ $\frac{\text{---}}{0}$ π_q

0100010 π_q $\frac{1}{0}$ $\frac{2}{1}$ $\frac{3}{0}$ $\frac{4}{0}$ $\frac{5}{0}$ $\frac{6}{1}$ $\frac{7}{0}$ π_q

[illegible]

00100010 π_q $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ π_q

4) Di - Ke

These formulae are preceded by a cadence on Di (section C2, C9, or E). Formulae in section A) may also be used to go from Di to Ke.

$$001 \quad \begin{array}{c} \Delta \\ \delta \end{array} \quad \begin{array}{c} \gamma \\ 0 \end{array} \quad \begin{array}{c} \gamma \\ 0 \end{array} \quad \begin{array}{c} \gamma \\ 1 \end{array} \quad \begin{array}{c} x \\ q \end{array}$$

0001 $\overset{\Delta}{\underset{\cdot}{\mathfrak{d}}} \rightarrow \overset{\Gamma}{\underset{\cdot}{\mathfrak{f}}} \rightarrow \overset{\Gamma}{\underset{\cdot}{\mathfrak{u}}} \rightarrow \text{---} \rightsquigarrow \text{---} \overset{\cdot}{\underset{\cdot}{\mathfrak{i}}} \rightarrow \overset{\cdot}{\underset{\cdot}{\mathfrak{q}}}$

0100

$\Delta_{\vec{q}}$

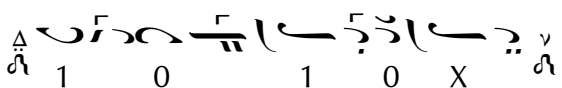
0 1 0 0 $\frac{x}{q}$

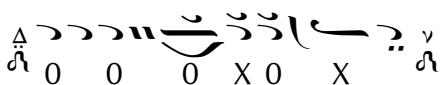
X100 $\Delta_{\text{eff}} = \frac{1}{\chi} \approx 1 - \frac{1}{\chi} \approx 0 - 0 \approx \frac{1}{q}$

X0001

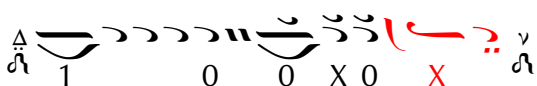
5) Di - Nee

These formulae are preceded by a cadence on Di (section C2, C9, or E). They may be followed by formulae from Pa.


1010X 

000X0X 

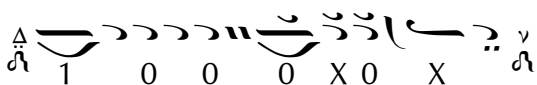


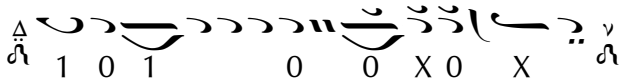
100X0X 



X000X0X 



1000X0X 

10100X0X 

6) Pa - Ga

These formulae must be followed by a cadence on Ke (section C8). These may also be used as initial formulae.

100

$$\pi_q \frac{1}{1} \frac{r}{r} \rightarrow \frac{r}{0} \rightarrow \frac{r}{0} \rightarrow r$$

$$0100 \quad \pi_q \quad \frac{1}{0} \quad \frac{1}{1} \quad \frac{1}{0} \quad \frac{1}{0} \quad r_n$$

$$\pi_q \frac{1}{0} \frac{1}{1} \frac{1}{0} \frac{1}{0} \frac{1}{n}$$

X000 $\pi_q \frac{1}{x} \frac{1}{0} \frac{1}{0} \frac{1}{0} \frac{1}{u}$

01000 π_q 0 1 0 0 0 π_n

$$\pi_q \begin{array}{c} \text{---} \\ | \\ 0 \end{array} \quad \begin{array}{c} \text{---} \\ | \\ 1 \end{array} \quad \begin{array}{c} \text{---} \\ | \\ 0 \end{array} \quad \begin{array}{c} \text{---} \\ | \\ 0 \end{array} \quad \begin{array}{c} \text{---} \\ | \\ 0 \end{array} \quad r_n$$

001000 π_q $\frac{1}{0}$ $\frac{1}{0}$ $\frac{2}{1}$ $\frac{3}{0}$ $\frac{5}{0}$ $\frac{7}{0}$ η

[illegible]


$$\begin{array}{ccccccc} \pi_q & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \\ & 0 & 0 & 0 & 1 & 0 & 0 \end{array}$$

0010000

π
q

0 0 1 0 0 0 0

η

0100100 π_q  r_n

7) Di - Ga

These formulae must be followed by a cadence on Ke (section C8).

00	$\overset{\Delta}{\underset{\sigma}{\mathfrak{A}}} \overset{\text{f}}{\text{—}} \underset{\sigma}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \mathfrak{N}$
00X	$\overset{\Delta}{\underset{\sigma}{\mathfrak{A}}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{\text{X}}{\text{—}} \underset{\text{—}}{\text{—}} \mathfrak{N}$
100	$\overset{\Delta}{\underset{\sigma}{\mathfrak{A}}} \underset{1}{\text{—}} \underset{\text{—}}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \mathfrak{N}$
X00	$\overset{\Delta}{\underset{\sigma}{\mathfrak{A}}} \underset{\text{X}}{\text{—}} \underset{\text{—}}{\text{—}} \underset{\sigma}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \mathfrak{N}$
10000	$\overset{\Delta}{\underset{\sigma}{\mathfrak{A}}} \underset{1}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \mathfrak{N}$
0100000	$\overset{\Delta}{\underset{\sigma}{\mathfrak{A}}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{\sigma}{\text{—}} \underset{0}{\text{—}} \mathfrak{N}$

8) Ga - Ke

These formulae must be preceded by a cadence on Ga (section C6 or C7).

10 $\begin{array}{c} \text{r} \quad \text{r} \quad \text{r} \quad \text{r} \\ \text{u} \quad \text{1} \quad \text{0} \quad \text{q} \end{array}$

$\begin{array}{c} \text{r} \quad \text{r} \quad \text{r} \quad \text{r} \\ \text{u} \quad \text{1} \quad \text{0} \quad \text{q} \end{array}$

$\begin{array}{c} \text{r} \quad \text{r} \quad \text{r} \\ \text{u} \quad \text{1} \quad \text{0} \quad \text{q} \end{array}$

$\begin{array}{c} \text{r} \quad \text{r} \quad \text{r} \\ \text{u} \quad \text{1} \quad \text{0} \quad \text{q} \end{array}$

100 $\begin{array}{c} \text{r} \quad \text{r} \quad \text{r} \quad \text{r} \\ \text{u} \quad \text{1} \quad \text{0} \quad \text{0} \quad \text{q} \end{array}$

10X $\begin{array}{c} \text{r} \quad \text{r} \quad \text{r} \quad \text{r} \\ \text{u} \quad \text{1} \quad \text{0} \quad \text{X} \quad \text{q} \end{array}$

9) Di - Di

These formulae are usually preceded by a formula in section C2.

010	$\overset{\Delta}{\underset{\text{A}}{\text{A}}} \xrightarrow{\text{0}} \xrightarrow{\text{1}} \xrightarrow{\text{0}} \overset{\Delta}{\underset{\text{A}}{\text{A}}}$
010X	$\overset{\Delta}{\underset{\text{A}}{\text{A}}} \xrightarrow{\text{0}} \xrightarrow{\text{1}} \xrightarrow{\text{0}} \text{X} \xrightarrow{\text{?}} \overset{\Delta}{\underset{\text{A}}{\text{A}}} \quad \text{X} \xrightarrow{\text{?}} \text{X}$
0100	$\overset{\Delta}{\underset{\text{A}}{\text{A}}} \xrightarrow{\text{0}} \xrightarrow{\text{1}} \xrightarrow{\text{0}} \xrightarrow{\text{0}} \overset{\Delta}{\underset{\text{A}}{\text{A}}}$
0001	$\overset{\Delta}{\underset{\text{A}}{\text{A}}} \xrightarrow{\text{0}} \xrightarrow{\text{0}} \xrightarrow{\text{0}} \xrightarrow{\text{1}} \overset{\Delta}{\underset{\text{A}}{\text{A}}}$
00010	$\overset{\Delta}{\underset{\text{A}}{\text{A}}} \xrightarrow{\text{0}} \xrightarrow{\text{0}} \xrightarrow{\text{0}} \xrightarrow{\text{1}} \xrightarrow{\text{0}} \overset{\Delta}{\underset{\text{A}}{\text{A}}}$
010001	$\overset{\Delta}{\underset{\text{A}}{\text{A}}} \xrightarrow{\text{0}} \xrightarrow{\text{1}} \xrightarrow{\text{0}} \xrightarrow{\text{0}} \xrightarrow{\text{0}} \xrightarrow{\text{1}} \overset{\Delta}{\underset{\text{A}}{\text{A}}}$
100100	$\overset{\Delta}{\underset{\text{A}}{\text{A}}} \xrightarrow{\text{1}} \xrightarrow{\text{0}} \xrightarrow{\text{0}} \xrightarrow{\text{1}} \xrightarrow{\text{0}} \xrightarrow{\text{0}} \xrightarrow{\text{0}} \overset{\Delta}{\underset{\text{A}}{\text{A}}}$

10) Di - Pa

These formulae are preceded by a cadence on Di (section C2, C9, or E).

0010 $\overset{\Delta}{\underset{d_1}{\underbrace{\quad}}}$ $\underbrace{\quad}_0$ $\underbrace{\quad}_0$ $\underbrace{\quad}_1$ $\underbrace{\quad}_0$ πq

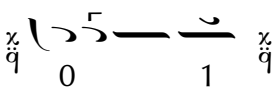
00010 Δ π

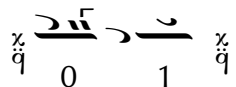
10010 $\overset{\Delta}{\mathfrak{A}} \frac{\mathfrak{F}}{1} \rightsquigarrow \mathfrak{B} \frac{\mathfrak{F}}{0} \rightsquigarrow \mathfrak{C} \frac{\mathfrak{F}}{0} \rightsquigarrow \mathfrak{D} \frac{\mathfrak{F}}{1} \rightsquigarrow \mathfrak{E} \frac{\mathfrak{F}}{0} \pi^q$

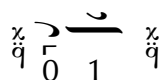
D) Medial Formulae: Ke - Ke

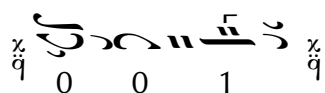
Some of these formulae may also be used as formulae from Pa to Ke.

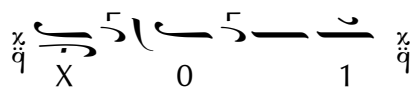
Accented on last syllable:

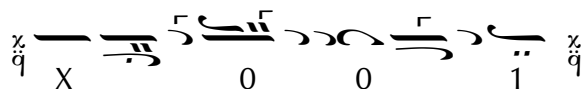
01 

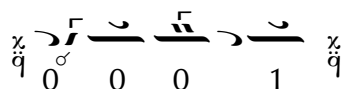


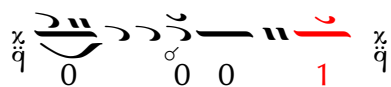


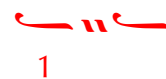
001 

X01 

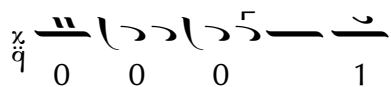
X001 

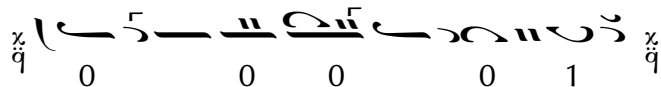
0001 

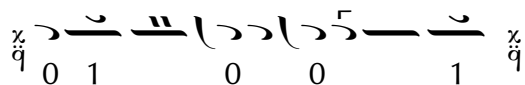








00001 

01001 

Third Mode - Sticheraric

10001		
100001		
010001		
10000X		
1000101		

Accented on second to last syllable:

Third Mode - Sticheraric

10

$$\frac{x}{q} \frac{\overline{}}{1} \overline{} - \frac{x}{q} \frac{\overline{}}{0} \overline{}$$
[illegible]
$$\begin{array}{ccc} \mathbb{Z} & \xrightarrow{\quad} & \mathbb{Z} \\ \uparrow & & \uparrow \\ \mathbb{Z} & \xrightarrow{\quad} & \mathbb{Z} \end{array}$$

010

$$\begin{array}{ccccccc} x & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & x \\ \ddot{q} & 0 & 1 & & & & 0 & \ddot{q} \end{array}$$

1

$$\begin{array}{c} \text{0} \quad \text{1} \quad \text{0} \\ \text{0} \quad \text{1} \quad \text{0} \end{array}$$
$$\begin{array}{ccccc} \frac{x}{q} & \frac{1}{0} & \frac{1}{1} & \frac{1}{0} & \frac{x}{q} \\ & 0 & 1 & 0 & \end{array}$$
$$\begin{array}{c} \text{0} \quad \text{1} \quad \text{0} \\ \text{0} \quad \text{1} \quad \text{0} \end{array}$$
$$\begin{array}{ccccccc} \frac{x}{q} & \text{---} & \cup & \cup & \cup & \cup & \frac{x}{q} \\ & 0 & 1 & & & & 0 \end{array}$$
$$\begin{array}{ccccc} \ddot{x} & \text{---} & \text{---} & \text{---} & \ddot{x} \\ \ddot{q} & 0 & 1 & 0 & \ddot{q} \end{array}$$
$$\begin{array}{ccccccc} \frac{x}{q} & \underbrace{\hspace{1.5cm}} & \underbrace{\hspace{1.5cm}} & \underbrace{\hspace{1.5cm}} & \underbrace{\hspace{1.5cm}} & \underbrace{\hspace{1.5cm}} & \frac{x}{q} \\ & 0 & 1 & & & 0 & \end{array}$$
$$\begin{array}{ccccccc} \times & & \sim & \Gamma & \sim & \sim & \times \\ \text{q} & \text{---} & 1 & \text{---} & & & \text{q} \\ 0 & & & & & & 0 \end{array}$$
$$\frac{\zeta}{0} \frac{\zeta}{1} \frac{r}{\infty} \gg \frac{\zeta}{0} ? \frac{\zeta}{q}$$

Third Mode - Sticheraric

	$\frac{x}{q} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \frac{x}{q}$ 0 1 0	
0110	$\frac{x}{q} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \frac{x}{q}$ 0 1 1 0	
0010	$\frac{x}{q} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \frac{x}{q}$ 0 0 1 0	
	$\frac{x}{q} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \frac{x}{q}$ 0 0 1 0	
	$\frac{x}{q} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \frac{x}{q}$ 0 0 1 0	
X010	$\frac{x}{q} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \frac{x}{q}$ X 0 1 0	
	$\frac{x}{q} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \frac{x}{q}$ X 0 1 0	
	$\frac{x}{q} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \frac{x}{q}$ X 0 1 0	
01010	$\frac{x}{q} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \frac{x}{q}$ 0 1 0 1 0	
	$\frac{x}{q} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \frac{x}{q}$ 0 1 0 1 0	
10010	$\frac{x}{q} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \frac{x}{q}$ 1 0 0 1 0	
	$\frac{x}{q} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \frac{x}{q}$ 1 0 0 1 0	
	$\frac{x}{q} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \frac{x}{q}$ 1 0 0 1 0	
	$\frac{x}{q} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \frac{x}{q}$ 1 0 0 1 0	

Third Mode - Sticheraric

00010	$\frac{x}{q}$ $\frac{x}{q}$	
100010	$\frac{x}{q}$ $\frac{x}{q}$	
	$\frac{x}{q}$ $\frac{x}{q}$	
X00010	$\frac{x}{q}$ $\frac{x}{q}$	
010010	$\frac{x}{q}$ $\frac{x}{q}$	
	$\frac{x}{q}$ $\frac{x}{q}$	
	$\frac{x}{q}$ $\frac{x}{q}$	
0010010	$\frac{x}{q}$ $\frac{x}{q}$	
	$\frac{x}{q}$ $\frac{x}{q}$	
	$\frac{x}{q}$ $\frac{x}{q}$	
0100010	$\frac{x}{q}$ $\frac{x}{q}$	
	$\frac{x}{q}$ $\frac{x}{q}$	

Third Mode - Sticheraric

$\frac{x}{q}$ — 0 1 0 0 0 0 1 0 $\frac{x}{q}$ 0
 $\frac{x}{q}$ — 0 1 0 0 0 0 1 0 $\frac{x}{q}$ 0
10010010 $\frac{x}{q}$ 1 0 0 1 0 0 1 0 $\frac{x}{q}$
01010010 $\frac{x}{q}$ 0 1 0 1 0 0 1 0 $\frac{x}{q}$
1010010010 $\frac{x}{q}$ 1 0 1 0 0 1 0 0 1 0 $\frac{x}{q}$

Accented on third to last syllable:

[illegible]

Third Mode - Sticheraric

0100

010X

10100

00100

000100

010100

Third Mode - Sticheraric

100100	
000X100	
1000100	
0110100	
X010100	
0100100	

Third Mode - Sticheraric

00100100 $\frac{x}{q}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{x}{q}$

Accented on fourth to last syllable:

1001 $\frac{x}{q} \frac{1}{1} \frac{1}{\sigma} \frac{1}{0} \frac{1}{0} \frac{1}{1} \frac{x}{q}$

Diagram illustrating the construction of a 2D grid from a 1D sequence of symbols. The top row shows a sequence of symbols: a black '1', a black '0', a red '0', and a red '1', flanked by two 'x/q' labels. Below this, a 2D grid is shown with two rows. The first row contains a red '0' and a red '1'. The second row contains a black '1' and a black '0'. The grid is labeled with 'x/q' on the left and 'y/q' on the top.

1010 $\frac{x}{q}$ 1 0 1 0 $\frac{x}{q}$

$$\begin{array}{ccccccc} \frac{x}{q} & \cup & \overline{\cup} & \cup & \overline{\cup} & \cup & \frac{x}{q} \\ & 1 & 0 & 1 & & & 0 \end{array}$$
$$\begin{array}{ccccccc} \frac{x}{q} & \overline{0} & \overline{2} & \overline{4} & \overline{6} & \overline{8} & \frac{x}{q} \\ & \underbrace{}_1 & & & & & \\ & & & 0 & & 1 & \\ & & & & & & 0 \end{array}$$
$$\begin{array}{ccccccc} \frac{x}{q} & \overline{2} & \overline{3} & \overline{2} & \overline{3} & \overline{2} & \frac{x}{q} \\ & 1 & 0 & 1 & 0 & 1 & \end{array}$$
[illegible]

X010

Third Mode - Sticheraric

1 0

01001

0 1 0 0 1

0 1 0 0 1

0 1 0 0 1

0 1 0 0 1

0 1 0 0 1

0 1 0 0 1 0 1

01010

0 1 0 1 0

0 1 0 1 0

0 1 0 1 0

001010

0 0 1 0 1 0

0101010

0 1 0 1 0 1 0

10001001

1 0 0 0 1 0 0 1

E) Formulae Ke - Di

100 $\frac{x}{q}$ 1 0 0 $\frac{\Delta}{\delta}$

100

01001 $\frac{x}{q}$ 0 1 $\frac{y}{q}$ 0 0 1 $\frac{z}{q}$

100100

$\frac{x}{q}$
 Δ

$\frac{x}{q}$ 1 0 0 1 0 0 $\frac{\Delta}{\delta}$

$$\frac{1}{0.5}$$

X0100100

0

F) Formulae with fthores

Accented on last syllable:

$$0001 \quad \begin{array}{c} \textcircled{\times} \\ q \end{array} \quad \begin{array}{c} \textcircled{\times} \\ 0 \end{array} \quad \begin{array}{c} \textcircled{\times} \\ 0 \end{array} \quad \begin{array}{c} \textcircled{\times} \\ 0 \end{array} \quad \begin{array}{c} \textcircled{\times} \\ 1 \end{array} \quad \Delta$$

Accented on second to last syllable:

$$0010 \quad \begin{array}{cccc} \chi & & & \pi \\ \bar{q} & \bar{q} & \bar{q} & q \end{array} \quad \begin{array}{cccc} \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright \\ 0 & 0 & 1 & 0 \end{array}$$
$$\frac{\pi}{q} \left(\frac{0}{0} \frac{2}{0} \frac{1}{1} \frac{1}{1} \frac{1}{1} \frac{1}{0} \frac{0}{\pi} \right)$$


01X0

10010

$\pi_q^{\otimes 5}$

1 0 0 1 0

$$\begin{array}{ccccccc} \frac{x}{q} & \frac{1}{2} & \frac{1}{3} & \frac{1}{4} & \frac{1}{5} & \frac{1}{6} & \frac{1}{7} \\ 1 & 0 & 0 & 0 & 0 & 1 & 0 \end{array} \quad \frac{\pi}{q}$$
$$\frac{\varphi}{x} \frac{q}{q} \frac{1}{1} \frac{1}{1} - \frac{1}{0} \frac{1}{0} \frac{1}{1} \frac{1}{0} \frac{1}{q} \frac{q}{q}$$
$$\frac{x}{q} \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad x$$

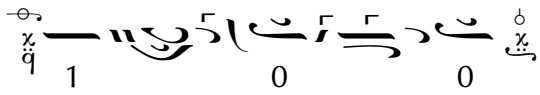
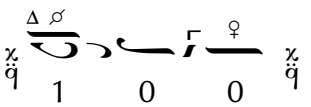
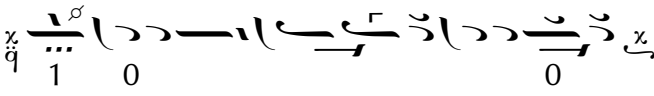
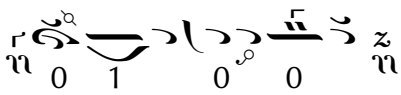
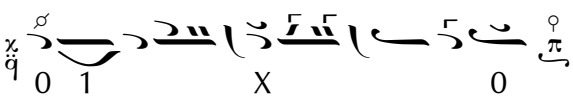

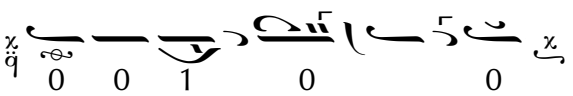
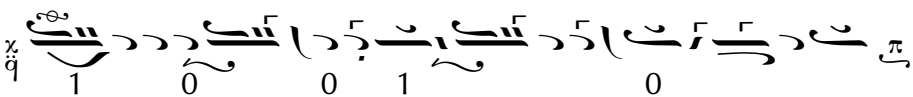
100010 

$$\frac{x}{q} \frac{1}{1} \frac{1}{0} \frac{1}{0} \frac{1}{0} \frac{1}{1} \frac{1}{0} \frac{1}{x}$$

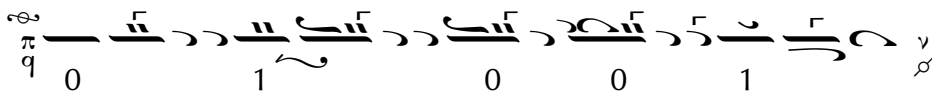
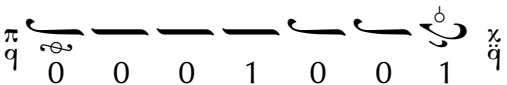
1000010

Accented on third to last syllable:

Third Mode - Sticheraric

100	
100	
100	
0100	
01X0	
00100	
	
100100	

Accented on fourth to last syllable:

01001	
0001001	

G) Old (slow) Sticheraric Formulae

(This section is noticeably briefer than the corresponding old sticheraric sections in other modes.

This is due to the fact that composers used very few elaborate formulae for melodies in third mode)

Accented on last syllable:

01

0001

Accented on second to last syllable:

10

010

010

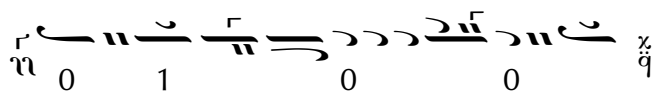
010


0010

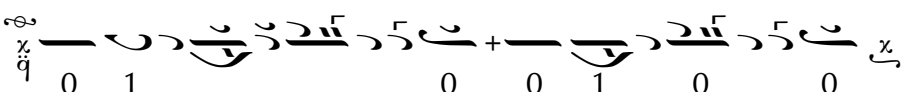
10010

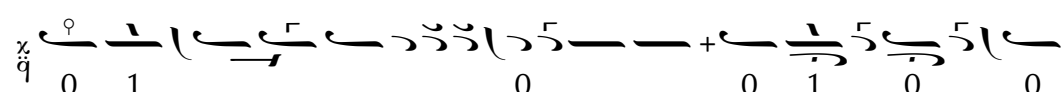
Third Mode - Sticheraric

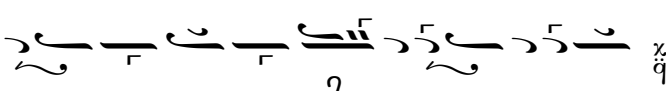
Accented on third to last syllable:

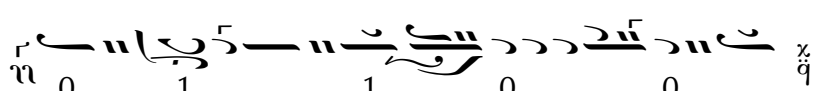
0100 

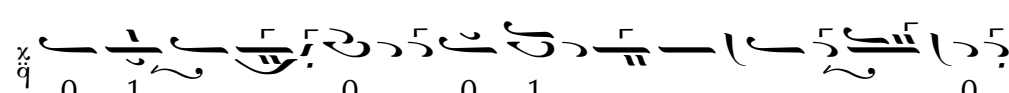
0100 


0100 

0100 

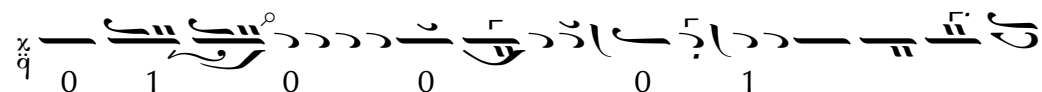
0100 

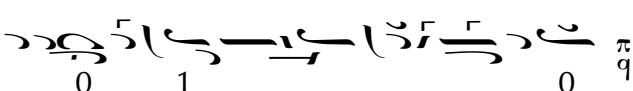
01100 

0100100 

0100100 

Accented on fourth to last syllable:

010001010 

010001010 

H) Semi-final Formulae: Ke - Ga

(To be followed by formulae in section I)

$$0 \leq \ddot{q} \leq \frac{\gamma}{0} \frac{r}{n}$$
$$\frac{\partial}{\partial \tau} \left(\frac{\partial \mathcal{L}}{\partial \dot{\tau}} \right) = \frac{\partial \mathcal{L}}{\partial \tau}$$
$$\frac{\chi}{\ddot{q}} \frac{\sqrt{2}}{0} \frac{1}{0} \frac{1}{n}$$

10

$$\frac{x}{q} \rightarrow \frac{1}{1} \rightarrow \frac{1}{5} \rightarrow \frac{2}{0} \rightarrow \frac{1}{n}$$

100 $\frac{x}{q} \underbrace{\quad}_1 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_n$

010

$\frac{x}{q}$

0 1 0 n

0	1

$$\begin{array}{ccccccc} x & & & & & & r \\ \ddot{q} & \rightarrow & \leftarrow & \rightarrow & \leftarrow & \rightarrow & n \\ & 0 & 1 & & 0 & & \end{array}$$

110 $\frac{x}{q} - \frac{y}{1} - \frac{z}{1} - \frac{w}{0} - \frac{v}{n}$

0100 $\frac{x}{q} - \frac{u}{1} \rightarrow \frac{v}{0} \rightarrow \frac{w}{0} \rightarrow r$

1010 $\frac{x}{q} \frac{1}{1} \frac{1}{0} \frac{1}{1} \frac{1}{0} \frac{1}{n}$

00100

100100 $\frac{x}{q} \frac{\overbrace{\cup}^{\cup}}{1} \overbrace{\cup}^{\cup} \overbrace{\cup}^{\cup} \overbrace{\cup}^{\cup} \frac{\overbrace{\cup}^{\cup}}{1} \frac{\overbrace{\cup}^{\cup}}{0} \overbrace{\cup}^{\cup} \overbrace{\cup}^{\cup} \overbrace{\cup}^{\cup} \overbrace{\cup}^{\cup} r$

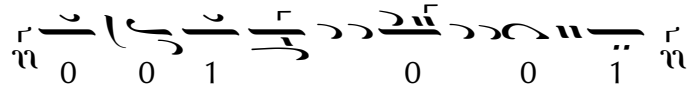
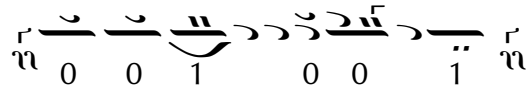
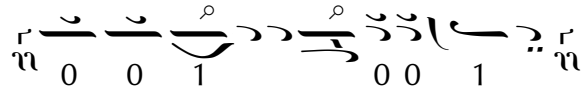
I) Final Cadences: Ga - Ga

(to be preceded by a semi-final formula in section H)

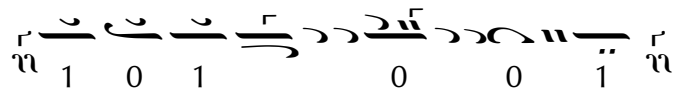
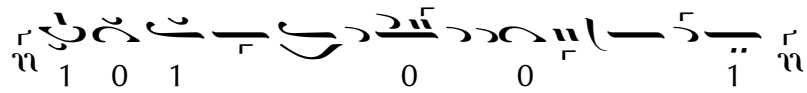
10		
100		
1000		
1001		
00100		
00101		
10X0X		
X0100		
10100		

Third Mode - Sticheraric

001001



101001



J) Other Final Cadences

(not preceded by a semi-final formula in section H)

Accented on last syllable:

(Some formulae below ending in 100 may also be used here.)

11010001 π
 $\overset{\circ}{\text{q}}$ 1 1 0 1 0 0 0 1 r

Accented on second to last syllable:

0010 π
 $\overset{\circ}{\text{q}}$ 0 0 1 0 r

01010 π
 $\overset{\circ}{\text{q}}$ 0 1 0 1 0 r

010010 π
 $\overset{\circ}{\text{q}}$ 0 1 0 0 1 0 r

Accented on third to last syllable:

100100 π
 $\overset{\circ}{\text{q}}$ 1 0 0 1 0 0 r

π
 $\overset{\circ}{\text{q}}$ 1 0 0 1 0 0 r

π
 $\overset{\circ}{\text{q}}$ 1 0 0 1 0 0 r

π
 $\overset{\circ}{\text{q}}$ 1 0 0 1 0 0 r

π
 $\overset{\circ}{\text{q}}$ 1 0 0 1 0 0 r

1

Third Mode - Sticheraric

$\begin{matrix} \times \\ q \end{matrix}$

 1 0 0 1 0 0

0

01100100
 $\begin{matrix} \times \\ q \end{matrix}$

 0 1 1 0 0 1 0

10100100
 $\begin{matrix} \times \\ q \end{matrix}$

 1 0 1 0 0 1 0

Accented on fourth to last syllable:

1001
 $\begin{matrix} \times \\ q \end{matrix}$

 1 0 0 1

K) Final Cadences for Theotokia

00100

00101

100100

BYZANTINE MUSIC FORMULAE

Third Mode - Heirmologic

Contents^{*}

A) Cadences on Di	248
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C) Cadences on Pa.....	264
E) Formulae with Fthoras	268
F) Ending Formulae.....	269
G) Endings for Theotokia	272

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

* The Byzantine music formulae herein were extracted from all the heirmologic melodies found in the Zoe Anastasimatarion (14th edition, 2002).

Third Mode - Heirmologic

A) Cadences on Di

Heirmologic third mode melodies usually begin with one of these formulae.

Note that there are no formulae in this section beginning on Ke. This is because melodies in heirmologic third mode do not move directly from Ke to Di.

Accented on last syllable:

From Pa

0	$\pi \overset{\Delta}{\underset{0}{q}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
000	$\pi \overset{\Delta}{\underset{0}{q}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
10001	$\pi \overset{\Delta}{\underset{1}{q}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{1}{\text{—}}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$

From Di

00	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
010001	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{1}{\text{—}}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{1}{\text{—}}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$

Accented on second to last syllable:

From Pa

10	$\pi \overset{\Delta}{\underset{1}{q}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$	$\overset{\Delta}{\underset{1}{\text{—}}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
010	$\pi \overset{\Delta}{\underset{0}{q}} \overset{\Delta}{\underset{1}{\text{—}}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$	
0010	$\pi \overset{\Delta}{\underset{0}{q}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{1}{\text{—}}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$	
10010	$\pi \overset{\Delta}{\underset{1}{q}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{1}{\text{—}}} \overset{\Delta}{\underset{0}{\text{—}}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$	

Third Mode - Heirmologic

From Di

10

$\begin{array}{c} \Delta \\ \alpha \end{array} \quad \begin{array}{c} \Delta \\ \alpha \end{array}$

$\begin{array}{c} 1 \\ 0 \end{array}$

$\begin{array}{c} \Delta \\ \alpha \end{array}$

$\begin{array}{c} \Delta \\ \alpha \end{array}$

$\begin{array}{c} 1 \\ 1 \end{array}$


00010

$\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$ $\overbrace{\quad \quad \quad}^{\Delta}$ $\underbrace{\quad \quad \quad}_{\Delta}$

 0 0 0 1 0

10010 Δ
 Δ

 1 0 0 1 0

Δ 
 Δ

[illegible]
$$\begin{array}{ccccccc} \Delta & \text{---} & \cup & \cup & \cup & \cup & \Delta \\ \text{♂} & \text{♀} & & & & & \text{♂} \\ 0 & 1 & 0 & 0 & 1 & 0 & \end{array}$$

Δ

100010

Δ

1 0 0 0 1 0

Accented on third to last syllable:

From Pa

100

π q 1 0 0 δ λ

0100 π_q $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{\Delta}{\mathfrak{A}}$

010X $\pi_q \frac{1}{0} \frac{1}{1} \frac{1}{0} X \frac{\Delta}{\partial \tilde{\mathcal{A}}}$

00100 π_q $\frac{1}{0}$ $\frac{1}{0}$ $\frac{2}{1}$ $\frac{3}{0}$ $\frac{4}{0}$ $\frac{5}{0}$

$$\pi_q \begin{array}{ccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 0 & 1 & 0 & 0 \end{array} \Delta_{\mathfrak{A}}$$

Third Mode - Heirmologic

0010100

π
q 0 0 1 0 0 Δ
d

0010100

π
q 0 0 1 0 1 0 0 Δ
d

00X0100

π
q 0 0 X 0 1 0 0 Δ
d

1000100

π
q 1 0 0 0 1 0 0 Δ
d

1 0

From Di

0100

Δ
d 0 1 0 0 Δ
d

1

010100

Δ
d 0 1 0 1 0 0 Δ
d

100100

Δ
d 1 0 0 1 0 0 Δ
d

001100

Δ
d 0 0 1 1 0 0 Δ
d

0100100

Δ
d 0 1 0 0 1 0 0 Δ
d

Accented on fourth to last syllable:

From Pa

01000

π
q 0 1 0 0 0 Δ
d

01010

π
q 0 1 0 0 0 Δ
d

001010

π
q 0 0 1 0 1 0 Δ
d

Third Mode - Heirmologic

From Di

01000 $\overset{\Delta}{\underset{\cdot\cdot}{\mathfrak{A}}}$ $\overline{\quad}$ $\overline{\quad}$ $\overline{\quad}$ $\overline{\quad}$ $\overset{\Delta}{\underset{\cdot\cdot}{\mathfrak{A}}}$
 0 1 0 0 0

001100 $\overset{\Delta}{\underset{\cdot\cdot}{\mathfrak{A}}}$ $\overline{\quad}$ $\overline{\quad}$ $\overline{\quad}$ $\overline{\quad}$ $\overline{\quad}$ $\overline{\quad}$ $\overset{\Delta}{\underset{\cdot\cdot}{\mathfrak{A}}}$
 0 0 1 1 0 0


B) Cadences on Ke

Accented on last syllable:

From Pa

$$10001 \quad \pi_q^{\frac{1}{2}} \quad \frac{1}{1} \quad \frac{1}{0} \quad \frac{1}{0} \quad \frac{1}{0} \quad \frac{1}{1} \quad \frac{1}{q}$$
$$010001 \quad \pi_q \overbrace{\quad \quad \quad}^f \quad \underbrace{\quad \quad \quad}_0 \quad \underbrace{\quad \quad \quad}_1 \quad \underbrace{\quad \quad \quad}_0 \quad \underbrace{\quad \quad \quad}_0 \quad \underbrace{\quad \quad \quad}_0 \quad \underbrace{\quad \quad \quad}_1 \quad \underbrace{\quad \quad \quad}_{\bar{q}}$$

0010001

π_q  x_q

From Di

0001 $\overset{\Delta}{\underset{\sigma}{\mathfrak{d}}}$ $\overset{\Delta}{\underset{\sigma}{\mathfrak{d}}}$ $\overset{\Delta}{\underset{\sigma}{\mathfrak{d}}}$ $\overset{\Delta}{\underset{\sigma}{\mathfrak{d}}}$ $\overset{\Delta}{\underset{\sigma}{\mathfrak{d}}}$

10001

$$\begin{array}{ccccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \\ \partial_0 & 1 & 0 & 0 & 0 & 0 & 1 & & x_q \end{array}$$

100001

Δ
 δ
 $\frac{x}{q}$

From Ke

$$000 \quad \begin{array}{c} x \\ q \end{array} \overbrace{\quad\quad\quad}^{} \underbrace{\quad\quad\quad}_0 \underbrace{\quad\quad\quad}_0 \underbrace{\quad\quad\quad}_0 \begin{array}{c} x \\ q \end{array}$$
$$\begin{array}{c} \text{X} \\ \text{q} \\ \text{0} \quad \text{0} \quad \text{0} \end{array}$$
$$001 \quad \begin{array}{c} \overline{x} \quad \overline{y} \quad \overline{z} \\ \overline{q} \quad 0 \quad 0 \quad 1 \quad \overline{q} \end{array}$$
$$0000 \quad \overbrace{\frac{x}{q} \quad 0 \quad 0 \quad 0 \quad 0}^{\frac{x}{q}}$$

Third Mode - Heirmologic

	$\frac{x}{q} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \frac{x}{q}$ 0 0 0 0
0001	$\frac{x}{q} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \frac{x}{q}$ 0 0 0 1
00001	$\frac{x}{q} \overline{\quad}^{\circ} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \frac{x}{q}$ 0 0 0 0 1
10001	$\frac{x}{q} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \frac{x}{q}$ 1 0 0 0 1
	$\frac{x}{q} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \frac{x}{q}$ 1 0 0 0 1
010001	$\frac{x}{q} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \frac{x}{q}$ 0 1 0 0 0 1
100001	$\frac{x}{q} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \frac{x}{q}$ 1 0 0 0 0 1
01X0001	$\frac{x}{q} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \frac{x}{q}$ 0 1 X 0 0 0 1
0100001	$\frac{x}{q} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \frac{x}{q}$ 0 1 0 0 0 0 1
01010001	$\frac{x}{q} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \frac{x}{q}$ 0 1 0 1 0 0 0 1
	$\frac{x}{q} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \frac{x}{q}$ 0 1 0 1 0 0 0 1

Accented on second to last syllable:

From Pa

10	$\frac{\pi}{q} \overline{\quad} \overline{\quad} \frac{x}{q}$ 1 0
----	--

Third Mode - Heirmologic

010

0010

0 1

$$\pi_q \begin{array}{c} \text{---} \text{---} \text{---} \text{---} \\ 0 \quad 0 \quad 1 \quad 0 \end{array} \chi_{\bar{q}}$$

00X10

10010

010010

100010

110010

1000010

1010010

X010010

From Di

0010

00010

Third Mode - Heirmologic

10010

010010

100010

110010

100X010

1000X010

01010010

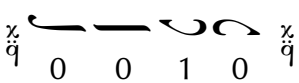
100X0X010

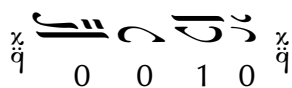
From Ke

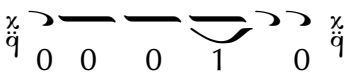
10

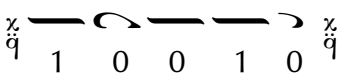
010

Third Mode - Heirmologic

0010 

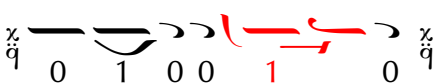


00010 

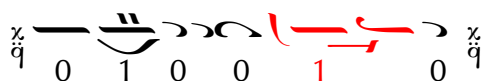
10010 



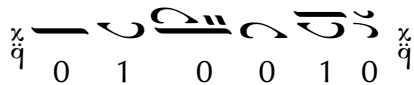


010010 








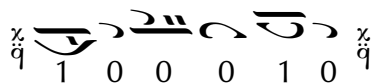


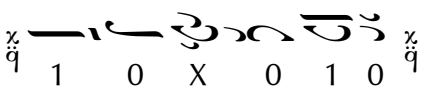


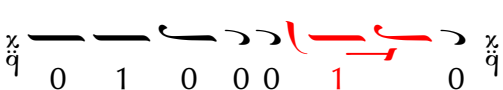
000010 

100010 





101010 

0100010 



Third Mode - Heirmologic

010X010	$\pi_{\dot{q}}$ $\pi_{\dot{q}}$ 0 1 0 X 0 1 0	 0 1
10X0010	$\pi_{\dot{q}}$ $\pi_{\dot{q}}$ 1 0 X 0 0 1 0	
01000010	$\pi_{\dot{q}}$ $\pi_{\dot{q}}$ 0 1 0 0 0 0 1 0	

Accented on third to last syllable:

From Pa

0100	$\pi_{\dot{q}}$ $\pi_{\dot{q}}$ 0 1 0 0	
00100	$\pi_{\dot{q}}$ $\pi_{\dot{q}}$ 0 0 1 0 0	
000100	$\pi_{\dot{q}}$ $\pi_{\dot{q}}$ 0 0 0 1 0 0	
0X0100	$\pi_{\dot{q}}$ $\pi_{\dot{q}}$ 0 X 0 1 0 0	
100100	$\pi_{\dot{q}}$ $\pi_{\dot{q}}$ 1 0 0 1 0 0	
00X0101	$\pi_{\dot{q}}$ $\pi_{\dot{q}}$ 0 0 X 0 1 0 1	 1
0100100	$\pi_{\dot{q}}$ $\pi_{\dot{q}}$ 0 1 0 0 1 0 0	
10100100	$\pi_{\dot{q}}$ $\pi_{\dot{q}}$ 1 0 1 0 0 1 0 0	
010100100	$\pi_{\dot{q}}$ $\pi_{\dot{q}}$ 0 1 0 1 0 0 1 0 0	

Third Mode - Heirmologic

From Di

00100

Δ
 \mathcal{A}

0 0 1 0 0

\dot{q}

$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ \delta & & & & & & \text{---} \\ & 0 & 0 & 1 & 0 & 0 & \end{array}$$
$$\begin{array}{ccccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \\ \delta & 0 & 0 & 1 & 0 & 0 & 0 & 0 & \end{array} \begin{array}{c} x \\ q \end{array}$$

00010X

100100

Δ
 δ


1 0 0 1 0 0

$\frac{x}{q}$

1 0

1 0

0010100

Δ  \tilde{q}

0 0 1 0 1 0 0

$$\begin{array}{cccccccc} \Delta & \text{---} & \text{---} & \cup & \cup & \cup & \cup & \text{---} \\ \delta & 0 & 0 & 1 & 0 & 1 & 0 & 0 \end{array} \quad \begin{array}{c} x \\ q \end{array}$$
$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ \mathfrak{A} & 0 & 0 & 1 & 0 & 1 & 00 \\ & & & & & & \mathfrak{q} \end{array}$$

1000100

$\overset{\Delta}{\underset{A}{\curvearrowright}} \quad \overset{\sigma}{\underset{B}{\curvearrowright}} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \overset{x}{\underset{q}{\curvearrowright}}$

1 0 0 0 1 0 0

10000100

Δ
 δ

1 0 0 0 0 1 0 0

$\frac{x}{q}$

1

100X0100

Δ

1 0 0 X 0 1 0 0

$\frac{x}{q}$

Third Mode - Heirmologic

$\overset{\Delta}{\underset{\text{A}}{\text{A}}} \text{ } \overline{\text{1}} \text{ } \overline{\text{00X}} \text{ } \overline{\text{0}} \text{ } \overline{\text{1}} \text{ } \overline{\text{0}} \text{ } \overline{\text{0}} \text{ } \overset{\times}{\underset{\cdot}{\text{q}}}$

$\overset{\Delta}{\underset{\text{A}}{\text{A}}} \text{ } \overline{\text{1}} \text{ } \overline{\text{00X}} \text{ } \overline{\text{0}} \text{ } \overline{\text{1}} \text{ } \overline{\text{0}} \text{ } \overline{\text{0}} \text{ } \overset{\times}{\underset{\cdot}{\text{q}}}$

$\overline{\text{1}}$

$\overline{\text{1}}$

10100100

$\overset{\Delta}{\underset{\text{A}}{\text{A}}} \text{ } \overline{\text{1}} \text{ } \overline{\text{0}} \text{ } \overline{\text{1}} \text{ } \overline{\text{0}} \text{ } \overline{\text{0}} \text{ } \overline{\text{1}} \text{ } \overline{\text{0}} \text{ } \overline{\text{0}} \text{ } \overset{\times}{\underset{\cdot}{\text{q}}}$

From Ke

100

$\overset{\times}{\underset{\cdot}{\text{q}}} \text{ } \overline{\text{1}} \text{ } \overline{\text{0}} \text{ } \overline{\text{0}} \text{ } \overset{\times}{\underset{\cdot}{\text{q}}}$

$\overset{\times}{\underset{\cdot}{\text{q}}} \text{ } \overline{\text{1}} \text{ } \overline{\text{0}} \text{ } \overline{\text{0}} \text{ } \overset{\times}{\underset{\cdot}{\text{q}}}$

$\overset{\times}{\underset{\cdot}{\text{q}}} \text{ } \overline{\text{1}} \text{ } \overline{\text{0}} \text{ } \overline{\text{0}} \text{ } \overset{\times}{\underset{\cdot}{\text{q}}}$

$\overset{\times}{\underset{\cdot}{\text{q}}} \text{ } \overline{\text{1}} \text{ } \overline{\text{0}} \text{ } \overline{\text{0}} \text{ } \overset{\times}{\underset{\cdot}{\text{q}}}$

$\overline{\text{0}}$

0100

$\overset{\times}{\underset{\cdot}{\text{q}}} \text{ } \overline{\text{0}} \text{ } \overline{\text{1}} \text{ } \overline{\text{00}} \text{ } \overset{\times}{\underset{\cdot}{\text{q}}}$

$\overset{\circ}{\underset{\cdot}{\text{q}}} \text{ } \overline{\text{0}} \text{ } \overline{\text{1}} \text{ } \overline{\text{0}} \text{ } \overline{\text{0}} \text{ } \overset{\times}{\underset{\cdot}{\text{q}}}$

$\overset{\times}{\underset{\cdot}{\text{q}}} \text{ } \overline{\text{0}} \text{ } \overline{\text{1}} \text{ } \overline{\text{0}} \text{ } \overline{\text{0}} \text{ } \overset{\times}{\underset{\cdot}{\text{q}}}$

010X

$\overset{\times}{\underset{\cdot}{\text{q}}} \text{ } \overline{\text{0}} \text{ } \overline{\text{1}} \text{ } \overline{\text{0}} \text{ } \overline{\text{X}} \text{ } \overset{\times}{\underset{\cdot}{\text{q}}}$

Third Mode - Heirmologic

0110	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \text{---} \overset{\curvearrowright}{\text{---}} \text{---} \text{---} \text{---} \begin{array}{c} \text{X} \\ \text{q} \end{array}$ 0 1 1 0	
10100	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \text{---} \text{---} \text{---} \text{---} \text{---} \begin{array}{c} \text{X} \\ \text{q} \end{array}$ 1 0 1 0 0	
	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \text{---} \text{---} \text{---} \text{---} \text{---} \begin{array}{c} \text{X} \\ \text{q} \end{array}$ 1 0 1 0 0	
	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \text{---} \text{---} \text{---} \text{---} \text{---} \begin{array}{c} \text{X} \\ \text{q} \end{array}$ 1 0 1 0 0	
010100	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \begin{array}{c} \text{X} \\ \text{q} \end{array}$ 0 1 0 1 0 0	
	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \text{---} \text{---} \text{---} \text{---} \text{---} \begin{array}{c} \text{X} \\ \text{q} \end{array}$ 0 1 0 1 0 0	
	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \text{---} \text{---} \text{---} \text{---} \text{---} \begin{array}{c} \text{X} \\ \text{q} \end{array}$ 0 1 0 1 0 0	
0X0100	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \text{---} \text{---} \text{---} \text{---} \text{---} \begin{array}{c} \text{X} \\ \text{q} \end{array}$ 0 X 0 1 0 0	
100100	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \begin{array}{c} \text{X} \\ \text{q} \end{array}$ 1 0 0 1 0 0	
0000100	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \begin{array}{c} \text{X} \\ \text{q} \end{array}$ 0 0 0 0 1 0 0	
0100100	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \begin{array}{c} \text{X} \\ \text{q} \end{array}$ 0 1 0 0 1 0 0	--- 0
	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \begin{array}{c} \text{X} \\ \text{q} \end{array}$ 0 1 0 0 1 0 0	--- 1
	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \begin{array}{c} \text{X} \\ \text{q} \end{array}$ 0 1 0 0 1 0 0	
	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \begin{array}{c} \text{X} \\ \text{q} \end{array}$ 0 1 0 0 1 0 0	

Third Mode - Heirmologic

1000100	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \text{X} \text{q}$ 1 0 0 0 1 0 0	$\overline{\text{—}} \overline{\text{—}} \overline{\text{—}}$ 1 0 0
	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \text{X} \text{q}$ 1 0 0 0 1 0 0	
	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \text{X} \text{q}$ 1 0 0 0 1 0 0	
10X0100	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \text{X} \text{q}$ 1 0 X 0 1 0 0	
	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \text{X} \text{q}$ 1 0 X 0 1 0 0	
01000100	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \text{X} \text{q}$ 0 1 0 0 0 1 0 0	
010100100	$\begin{array}{c} \text{X} \\ \text{q} \end{array} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \text{X} \text{q}$ 0 1 0 1 0 0 1 0 0	

Accented on fourth to last syllable:

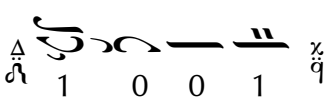
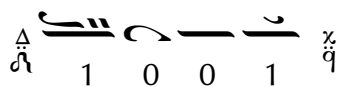
From Pa

1001	$\begin{array}{c} \pi \\ \text{q} \end{array} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \text{X} \text{q}$ 1 0 0 1	
01010	$\begin{array}{c} \pi \\ \text{q} \end{array} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \text{X} \text{q}$ 0 1 0 1 0	
001001	$\begin{array}{c} \pi \\ \text{q} \end{array} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \text{X} \text{q}$ 0 0 1 0 0 1	
101001	$\begin{array}{c} \pi \\ \text{q} \end{array} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \text{X} \text{q}$ 1 0 1 0 0 1	
1001001	$\begin{array}{c} \pi \\ \text{q} \end{array} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \text{X} \text{q}$ 1 0 0 1 0 0 1	

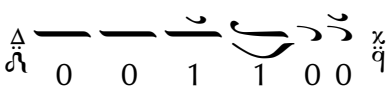
Third Mode - Heirmologic

From Di

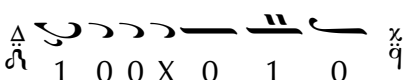
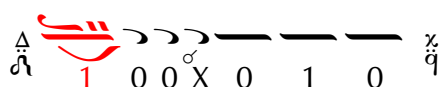
1001

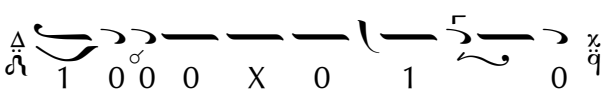
001100



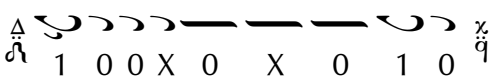
100X010


1000X010

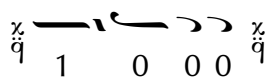


100X0X010

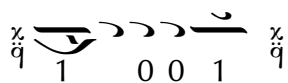
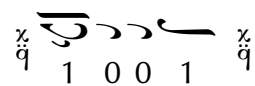


From Ke

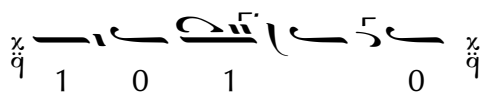
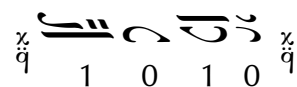
1000




1001

1010


Third Mode - Heirmologic


01001		
01010		
001001		
001010		
101001		
101010		
010X010		
0101010		

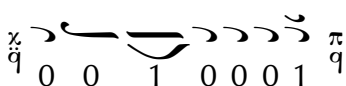
C) Cadences on Pa

Accented on last syllable:

From Ke

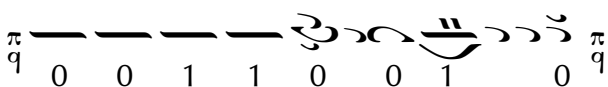
010001 

1X0001 



0010001 

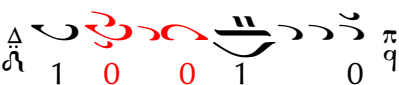
Accented on second to last syllable:

From Pa

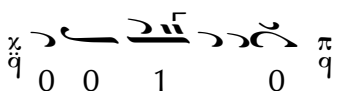
00110010 

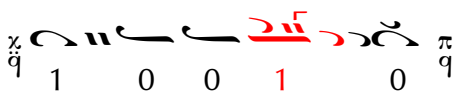
From Di

0010  

10010 

From Ke

0010 

10010 



Third Mode - Heirmologic

100010

$\frac{x}{q}$ 1 0 0 0 1 0 $\frac{\pi}{q}$

1 0 0 1 0

1 0


1 0

OX10010 $\frac{\pi}{q}$ 0 X 1 0 0 1 0 $\frac{\pi}{q}$

0100010

π_q $\overbrace{0 \ 1 \ 0 \ 0 \ 0 \ 1 \ 0}^{\pi_q}$

100X010

$\frac{x}{q}$  $\frac{\pi}{q}$

1010010

$\frac{x}{q}$
 $\frac{\pi}{q}$

0100X010

π_q
 π_q

0 1 0 0 X 0 1 0

100100010

$\frac{x}{q}$
 $\frac{\pi}{q}$

1 0 0 1 0 0 0 1 0

101000010

$\frac{x}{q}$
 $\frac{\pi}{q}$

1 0

1

$$\begin{array}{r} \overline{) 10} \\ \underline{0} \\ 10 \\ \underline{10} \\ 0 \end{array}$$

Third Mode - Heirmologic

$\begin{array}{cccccccccc} \text{q} & \text{q} & & & & & & & & \text{q} \\ \text{1} & \text{0} & \text{1} & \text{0} & \text{0} & \text{0} & \text{0} & \text{1} & \text{0} \end{array}$

Accented on third to last syllable:

From Ke

010100
 $\begin{array}{cccccccccc} \text{q} & \text{q} & & & & & & & & \text{q} \\ \text{0} & \text{1} & \text{0} & \text{1} & \text{0} & \text{0} & \text{0} & \text{1} & \text{0} \end{array}$

100100
 $\begin{array}{cccccccccc} \text{q} & \text{q} & & & & & & & & \text{q} \\ \text{1} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} & \text{0} & \text{1} & \text{0} \end{array}$

$\begin{array}{cc} \text{q} & \text{q} \\ \text{0} & \text{1} \end{array}$

$\begin{array}{cc} \text{q} & \text{q} \\ \text{0} & \text{1} \end{array}$

0010100
 $\begin{array}{cccccccccc} \text{q} & \text{q} & & & & & & & & \text{q} \\ \text{0} & \text{0} & \text{1} & \text{0} & \text{1} & \text{0} & \text{0} & \text{0} & \text{0} \end{array}$

1000100
 $\begin{array}{cccccccccc} \text{q} & \text{q} & & & & & & & & \text{q} \\ \text{1} & \text{0} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} & \text{0} & \text{0} \end{array}$

$\begin{array}{cc} \text{q} & \text{q} \\ \text{0} & \text{1} \end{array}$


$\begin{array}{cc} \text{q} & \text{q} \\ \text{0} & \text{1} \end{array}$

1100100
 $\begin{array}{cccccccccc} \text{q} & \text{q} & & & & & & & & \text{q} \\ \text{1} & \text{1} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} & \text{0} & \text{0} \end{array}$

1X000100
 $\begin{array}{cccccccccc} \text{q} & \text{q} & & & & & & & & \text{q} \\ \text{1} & \text{X} & \text{0} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} & \text{0} \end{array}$

Accented on fourth to last syllable:

From Ke

001010 $\frac{x}{q}$  $\frac{\pi}{q}$

0001010 $\frac{x}{q}$ 0 0 0 1 0 1 0 $\frac{\pi}{q}$

0101010

χ_q 0 1 0 1 0 1 0 π_q

1 0

100X010 $\frac{x}{q}$ 1 0 0 X 0 1 0 $\frac{\pi}{q}$

0100X010

$\frac{x}{q}$ 0 1 0 0 X 0 1 0 $\frac{\pi}{q}$

10001001

π_q
 π_q

10001010

χ_q  π_q

1 0 0 0 1 0 1 0

1 0

E) Formulae with Fthoras

From Pa

01010100 π
 $\overset{\circ}{q}$ 0 1 0 1 0 0 1 0 0 $\overset{\circ}{q}$

00100100100 π
 $\overset{\circ}{q}$ 0 0 1 0 0 1 0 0 1 0 0 $\overset{\circ}{q}$

From Di

100010 Δ
 $\overset{\circ}{q}$ 1 0 0 0 1 0 $\overset{\circ}{q}$

00100100 Δ
 $\overset{\circ}{q}$ 0 0 1 0 0 1 0 0 $\overset{\circ}{q}$

From Ke

010 π
 $\overset{\circ}{q}$ 0 0 0 $\overset{\circ}{q}$

100 π
 $\overset{\circ}{q}$ 1 0 0 $\overset{\circ}{q}$

01010 π
 $\overset{\circ}{q}$ 0 1 0 1 0 $\overset{\circ}{q}$

100100 π
 $\overset{\circ}{q}$ 1 0 0 1 0 0 $\overset{\circ}{q}$

000010010 π
 $\overset{\circ}{q}$ 0 0 0 0 1 0 0 1 0 $\overset{\circ}{q}$

F) Ending Formulae

Accented on last syllable:

(Formulae ending in 100 or 1001 may also be used here.)

From Pa

11010X01

From Ke

010001

0100001

10010001

Note: The alternate ending formulae in purple notes on pages 269-271 were used only by Petros Peloponnesios (in the 18th century) in his brief doxologies. Apparently, however, they fell into disuse, since they are not to be found in compositions of the 19th or 20th centuries.

Accented on second to last syllable:

From Ke

010010

X00010

0000010

Third Mode - Heirmologic

	$\begin{array}{c} \text{ⲛ} \\ \text{ⲓ} \end{array}$	
0010010	$\begin{array}{c} \text{ⲛ} \\ \text{ⲓ} \end{array}$	
0100010	$\begin{array}{c} \text{ⲛ} \\ \text{ⲓ} \end{array}$	
010X010	$\begin{array}{c} \text{ⲛ} \\ \text{ⲓ} \end{array}$	
00100010	$\begin{array}{c} \text{ⲛ} \\ \text{ⲓ} \end{array}$	
00110010	$\begin{array}{c} \text{ⲛ} \\ \text{ⲓ} \end{array}$	
10000010	$\begin{array}{c} \text{ⲛ} \\ \text{ⲓ} \end{array}$	
10010010	$\begin{array}{c} \text{ⲛ} \\ \text{ⲓ} \end{array}$	
10010010	$\begin{array}{c} \text{ⲛ} \\ \text{ⲓ} \end{array}$	
101010010	$\begin{array}{c} \text{ⲛ} \\ \text{ⲓ} \end{array}$	

Accented on third to last syllable:

From Pa

11010X01	$\begin{array}{c} \text{ⲛ} \\ \text{ⲓ} \end{array}$	
----------	---	--

From Ke

100100	$\begin{array}{c} \text{ⲛ} \\ \text{ⲓ} \end{array}$	
--------	---	--

Third Mode - Heirmologic

0000100		
010010X		
10X0100		
010X0100		
100X0100		

Accented on fourth to last syllable:

From Ke

01010		
101010		
010X010		
10X01001		


G) Endings for Theotokia*

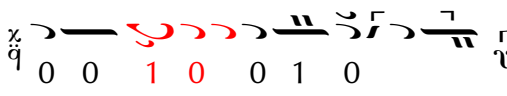
Accented on last syllable:


(Use a formula ending in 100 or 1001)


Accented on second to last syllable:

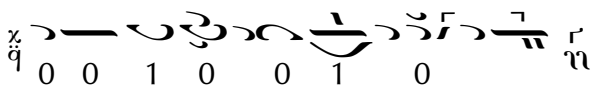
From Ke

00X010 

0010010 




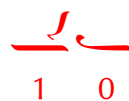




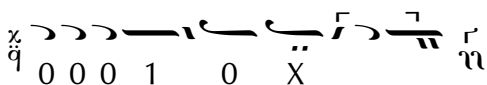
Accented on third to last syllable:

From Di

100100 

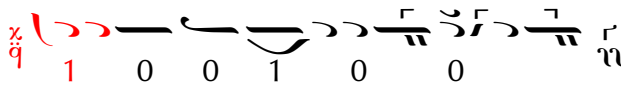

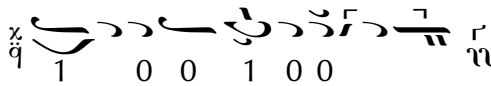
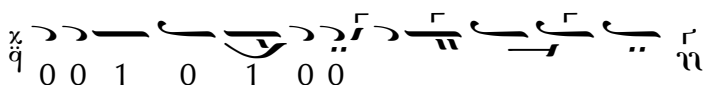

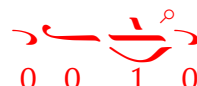

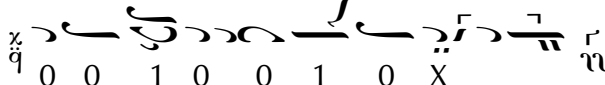
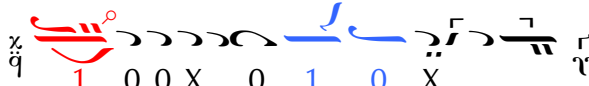

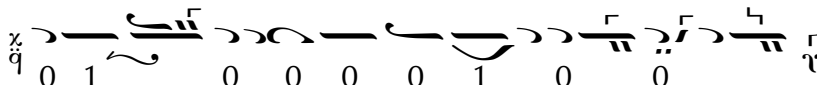
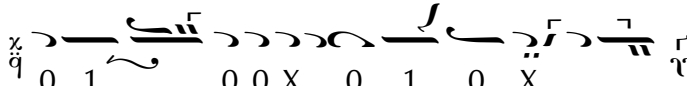


From Ke

00010X 

* Some formulae in this section are taken from the Athonite oral tradition, as represented in the book *Παρακλητική, Μουσικὸν Ἐγκόλπιον, Πλάγιοι Ἦχοι, Ἱεροθέου Ἱερομονάχου*, ἐκδόσεις Ἱ.Μ. Φιλοθέου, Ἁγίου Ὄρους, 2004.

Third Mode - Heirmologic

100100		
100100		
0010100		
100010X		
1010100		
0010010X		
100X010X		
		
010000100		
0100X010X		

Accented on fourth to last syllable:

From Ke

1001	
------	---

*Note: The above formula in blue was not taken from a publication in Greek but from the Rumanian Anastasimatarul published in 1943. I included this formula because it is the only occurrence of a 1001 final cadence in this mode that I could find in a publication with traditional formulae.



Fourth Mode



BYZANTINE MUSIC FORMULAE

Fourth Mode - Sticheraric

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* The Byzantine music formulae herein were extracted from sticheraric melodies found in the *Zoe Anastasimatarion* (14th edition, 2002) Volume I of *Mousike Kypsele* (1883 edition), the *Doxastarion* of Konstantinos Protopsaltis (1844 edition), and the volume I of the *Athonias* (1906 edition) by Petros Philanthidis.

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

Medial Cadences on Pa

A) Accented on Last Syllable

Pa - Pa

0001	π_q π_q
10X01	π_q π_q
10001	π_q π_q
100X001	π_q π_q
	π_q
	π_q
	π_q
01010001	π_q π_q
	π_q π_q
X0010X01	π_q π_q
	π_q
	π_q

Fourth Mode - Sticheraric

01010X01

X00010001

100010X01

Vou - Pa

This section is almost empty because medial cadences on Vou are rarely followed by a medial cadence on Pa

010010001

Di - Pa

10001

Fourth Mode - Sticheraric

0 0

1 0 0 0 1 q

1

0010001

0 0 0 1 0 0 0 1 q

B) Accented on Second to Last Syllable

Pa - Pa

10 $\pi_q \overbrace{\quad}^{\quad} \pi_q$
1 0

$\pi_q \overbrace{\quad}^{\quad} \pi_q$
1 0

010 $\pi_q \overline{\quad} \pi_q$
0 1 0

10010 $\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$
1 0 0 1 0

$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$
1 0 0 1 0

$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$
1 0 0 1 0

$\overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad}$
0 1

$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$
1 0 0 1 0

$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$
1 0 0 1 0

$\overline{\quad} \overline{\quad}$
1 0

11010 $\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$
1 1 0 1 0

010010 $\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$
0 1 0 0 1 0

$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$
0 1 0 0 1 0

$\pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$
0 1 0 0 1 0

Fourth Mode - Sticheraric

100010

π
q 1 0 0 0 1 0 π
q

π
q 1 0 0 0 1 0 π
q

0100010

π
q 0 1 0 0 0 1 0 π
q

π
q 0 1 0 0 0 1 0 π
q

π
q 0 1 0 0 0 1 0 π
q

π
q 0 1 0 0 0 1 0 π
q

1000010

π
q 1 0 0 0 0 1 0 π
q

Vou - Pa

This section is almost empty because medial cadences on Vou are rarely followed by a medial cadence on Pa

0100010

π
q 0 1 0 0 0 1 0 π
q

Di - Pa

10010

π
q 1 0 0 1 0 π
q

010010

π
q 0 1 0 0 1 0 π
q

0 1 0 0 1

0 1 0 0 1

Fourth Mode - Sticheraric

0 1 0 0 1

0 1

0 1

0010010 Δ 0 0 1 0 0 1 0 π 9

0 1

1010010 Δ 1 0 1 0 0 1 0 π 9

1 0 0 1

0100010 Δ 0 1 0 0 0 1 0 π 9

0 0 1

1000010 Δ 1 0 0 0 0 1 0 π 9

1 0 0 0

0X0X010 Δ 0 X 0 X 0 1 0 π 9

0 X 0 1

1010X010 Δ 1 0 1 0 X 0 1 0 π 9

Fourth Mode - Sticheraric



C) Accented on Third to Last Syllable

Pa - Pa

100 π_q $\frac{1}{1}$ $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{5}$ $\frac{1}{6}$ $\frac{1}{7}$ $\frac{1}{8}$ $\frac{1}{9}$ $\frac{1}{10}$ π_q

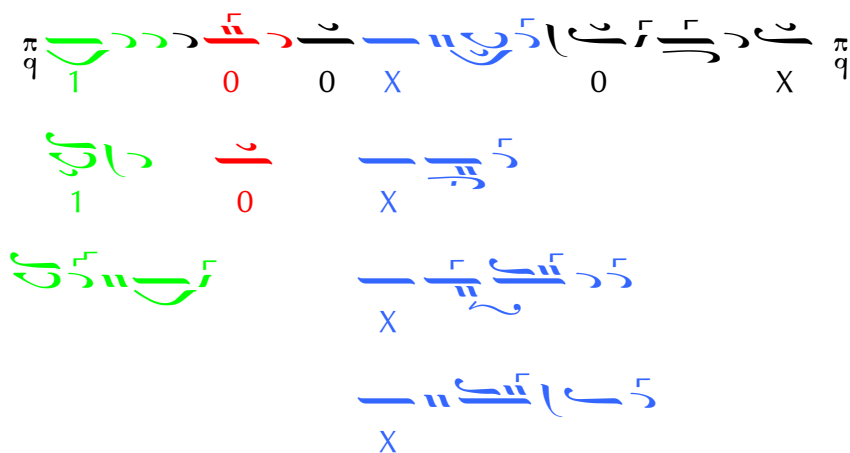
$$\pi_q \begin{array}{c} \overline{} \\ \underbrace{}_1 \end{array} \quad \overset{\curvearrowright}{} \quad \overset{\curvearrowright}{} \quad \pi_q$$
[illegible]
$$0100 \quad \pi_q \text{---} \overset{\pi}{\underset{0}{1}} \text{---} \overset{\pi}{0} \text{---} \overset{\pi}{0} \text{---} \pi_q$$
$$\pi_q \overbrace{\quad\quad\quad}^{\quad\quad\quad} \pi_q$$
$$10100 \quad \pi_q \quad \overbrace{1} \quad \overbrace{0} \quad \overbrace{1} \quad \overbrace{0} \quad \overbrace{0} \quad \pi_q$$
$$10X0X \quad \pi_q \quad \frac{1}{1} \quad \frac{1}{0} \quad \frac{1}{X} \quad \frac{1}{0} \quad \frac{1}{X} \quad \pi_q$$
$$000100 \quad \pi_q \overbrace{0 \ 0 \ 0}^{\quad} \underbrace{1}_{\quad} \overbrace{0 \ 0}^{\quad} \pi_q$$
$$\pi_q \begin{array}{c} \curvearrowright \\ 0 \end{array} \text{---} \begin{array}{c} \text{---} \\ 0 \end{array} \text{---} \begin{array}{c} \text{---} \\ 0 \end{array} \text{---} \begin{array}{c} \text{---} \\ 1 \end{array} \begin{array}{c} \curvearrowright \\ 0 \end{array} \begin{array}{c} \curvearrowright \\ 0 \end{array} \pi_q$$
$$010X0X \quad \pi_q \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \pi_q$$

0 1 0 X 0 X

$$\pi_q \begin{array}{cccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 1 & 0 & 1 & 0 & 0 \end{array} \pi_q$$
$$100X0X \quad \pi_q \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \pi_q$$
$$\pi_q \begin{array}{cccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 1 & 0 & 0 & 1 & 0 & 0 \end{array} \pi_q$$

Fourth Mode - Sticheraric

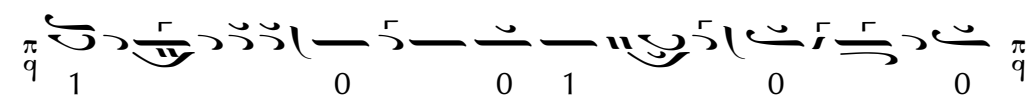
100X0X



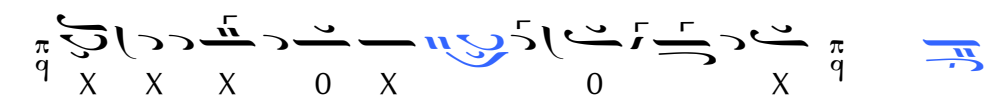
100X0X



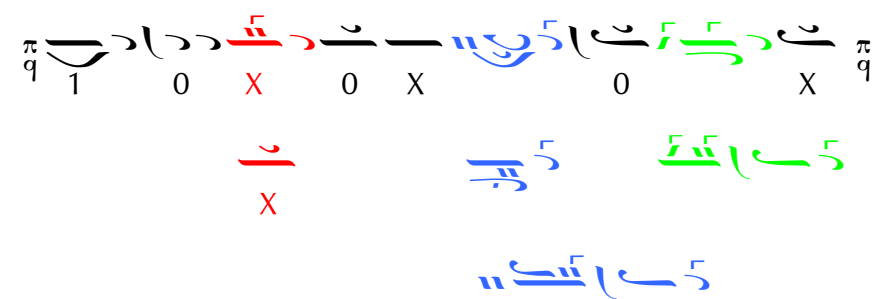
100100



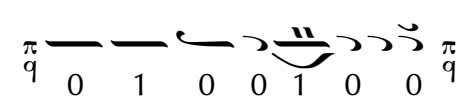
XXX0X0X



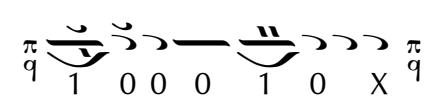
10X0X0X



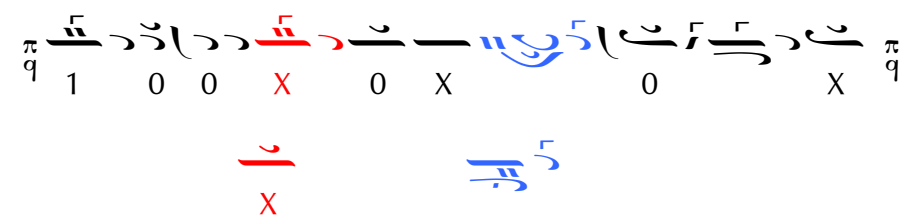
0100100



100010X



100X0X0X



Fourth Mode - Sticheraric

5 4 3 2 1

01000X0X π_q 0 1 0 0 0 X 0 X π_q

00010100 π_q 0 0 0 1 0 1 0 0 π_q

10010100 π_q 1 0 0 1 0 1 0 0 π_q

000100100 π_q 0 0 0 1 0 0 1 0 0 π_q

1010X00X0X

π_q 1 0 1 0 X 0 0 X 0 X π_q

0

X

X

X

Vou - Pa

This section is empty because medial cadences on Vou are rarely followed by a medial cadence on Pa

Di - Pa

100 Δ 1 0 0 π_q

1

0100 Δ 0 1 0 0 π_q

Fourth Mode - Sticheraric

10100 Δ $\overline{\text{1}}$ $\overline{\text{0}}$ $\overline{\text{1}}$ $\overline{\text{0}}$ $\overline{\text{0}}$ π $\overline{\text{9}}$

X010X Δ $\overline{\text{X}}$ $\overline{\text{0}}$ $\overline{\text{1}}$ $\overline{\text{0}}$ $\overline{\text{X}}$ π $\overline{\text{9}}$

$\overline{\text{1}}$ $\overline{\text{0}}$

$\overline{\text{1}}$ $\overline{\text{0}}$

10X0X Δ $\overline{\text{1}}$ $\overline{\text{0}}$ $\overline{\text{X}}$ $\overline{\text{0}}$ $\overline{\text{X}}$ π $\overline{\text{9}}$ $\overline{\text{0}}$

0X00100 Δ $\overline{\text{0}}$ $\overline{\text{X}}$ $\overline{\text{0}}$ $\overline{\text{0}}$ $\overline{\text{1}}$ $\overline{\text{0}}$ $\overline{\text{0}}$ π $\overline{\text{9}}$

0100100 Δ $\overline{\text{0}}$ $\overline{\text{1}}$ $\overline{\text{0}}$ $\overline{\text{0}}$ $\overline{\text{1}}$ $\overline{\text{0}}$ $\overline{\text{0}}$ π $\overline{\text{9}}$

$\overline{\text{0}}$ $\overline{\text{1}}$ $\overline{\text{0}}$ $\overline{\text{1}}$ $\overline{\text{0}}$

$\overline{\text{0}}$ $\overline{\text{1}}$ $\overline{\text{0}}$

0100X0X Δ $\overline{\text{0}}$ $\overline{\text{1}}$ $\overline{\text{0}}$ $\overline{\text{0}}$ $\overline{\text{X}}$ $\overline{\text{0}}$ $\overline{\text{X}}$ π $\overline{\text{9}}$

$\overline{\text{0}}$ $\overline{\text{1}}$

$\overline{\text{0}}$ $\overline{\text{1}}$

10XX0X0X Δ $\overline{\text{1}}$ $\overline{\text{0}}$ $\overline{\text{X}}$ $\overline{\text{X}}$ $\overline{\text{0}}$ $\overline{\text{X}}$ $\overline{\text{0}}$ $\overline{\text{X}}$ π $\overline{\text{9}}$

10XX0X0X Δ $\overline{\text{1}}$ $\overline{\text{0}}$ $\overline{\text{X}}$ $\overline{\text{X}}$ $\overline{\text{0}}$ $\overline{\text{X}}$ $\overline{\text{0}}$ $\overline{\text{X}}$ π $\overline{\text{9}}$ $\overline{\text{1}}$ $\overline{\text{0}}$

D) Accented on Fourth to Last Syllable

Pa - Pa


$$1010 \quad \pi_q \frac{1}{1} \curvearrowright \frac{1}{0} \overline{\text{---}} \frac{1}{1} \curvearrowleft \overline{\text{---}} \frac{1}{0} \pi_q$$
$$\pi_q \begin{array}{cccc} \circ & & & \circ \\ \text{---} & \text{---} & \text{---} & \text{---} \\ | & | & | & | \\ 1 & 0 & 1 & 0 \end{array}$$
$$\pi_q \frac{\overset{\circ}{\sim}}{1} \underset{0}{\sim} \underset{1}{\sim} \underset{\sim}{\sim} (\underset{\sim}{\sim}) \underset{0}{\sim} \pi_q$$

01010

π_q 0 1 0 1 0 π_q

$$01000 \quad \pi_q \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \pi_q$$

001010

π_q  π_q

0 0 1 0 1 0

0X01001

Diagram illustrating a sequence of nodes (0, X, 0, 1, 0, 0, 1, 0) connected by lines, with associated mathematical symbols (π_q) and arrows indicating a flow or relationship.

0XX01001

0 X X 0 1 0 0 1

Vou - Pa

This section is almost empty because medial cadences on Vou are rarely followed by a medial cadence on Pa

[illegible]

Di - Pa

[illegible]

X010

Δ_{A}

$\frac{\pi}{q}$

0 1 0

✕

Fourth Mode - Sticheraric

01001

Δ δ 0 1 0 0 1 π 9

X01001

Δ δ X 0 1 0 0 1 π 9

0

0X01010

Δ δ 0 X 0 1 0 1 0 π 9

X 1 0

0100X010

Δ δ 0 1 0 0 X 0 1 0 π 9

0 1 0 X 0 1

0 1 0

Medial Cadences on Vou

E) Accented on Last Syllable

Pa - Vou

This section is small because melodies in fourth mode do not frequently move from Pa to Vou.

10001 $\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ \text{1} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{1} \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

010001 $\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{1} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{1} \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

00010001 $\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{1} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{1} \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

Vou - Vou

This section is also almost empty because medial cadences on Vou are rarely followed by another medial cadence on Vou

01 $\begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{1} \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

X001 $\begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array} \begin{array}{c} \text{—} \\ \text{X} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{1} \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

10001 $\begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array} \begin{array}{c} \text{—} \\ \text{1} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{1} \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

$\begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array} \begin{array}{c} \text{—} \\ \text{1} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{1} \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

Di - Vou

This section is almost empty because melodies in this mode do not move from Di to Vou in many ways.

10X001 $\begin{array}{c} \text{—} \\ \text{Δ} \\ \text{λ} \end{array} \begin{array}{c} \text{—} \\ \text{1} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{X} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{0} \end{array} \begin{array}{c} \text{—} \\ \text{1} \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

F) Accented on Second to Last Syllable

Pa - Vou

This section is almost empty because melodies in fourth mode do not frequently move from Pa to Vou.

0010 $\begin{array}{c} \pi \\ \eta \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \lambda \end{array}$

00010 $\begin{array}{c} \pi \\ \eta \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \lambda \end{array} \begin{array}{c} \text{—} \\ \lambda \end{array} \begin{array}{c} \text{—} \\ \lambda \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \lambda \end{array}$

Vou - Vou

This section is small because medial cadences on Vou are rarely followed by another medial cadence on Vou

010 $\begin{array}{c} \text{—} \\ \lambda \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \lambda \end{array}$

10010 $\begin{array}{c} \text{—} \\ \lambda \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \lambda \end{array} \begin{array}{c} \text{—} \\ 1 \end{array}$

$\begin{array}{c} \text{—} \\ \lambda \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \lambda \end{array} \begin{array}{c} \text{—} \\ 1 \end{array}$

Di - Vou

010 $\begin{array}{c} \Delta \\ \lambda \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \lambda \end{array}$

0010 $\begin{array}{c} \Delta \\ \lambda \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \lambda \end{array}$

10010 $\begin{array}{c} \Delta \\ \lambda \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \lambda \end{array}$

G) Accented on Third to Last Syllable

Pa - Vou

100	π η 1 0 0
	π η 1 0 0
	π η 1 0 0
0100	π η 0 1 0 0
00100	π η 0 0 1 0 0
	π η 0 0 1 0 0
	π η 0 0 1 0 0
100100	π η 1 0 0 1 0 0
0X0101	π η 0 X 0 1 0 1
1000100	π η 1 0 0 0 1 0 0
0010100	π η 0 0 1 0 1 0 0
10010100	π η 1 0 0 1 0 1 0 0
	π η 1 0 0 1 0 1 0 0
	π η 1 0 0 1 0 1 0 0

0

Fourth Mode - Sticheraric

Vou - Vou

$$0100 \quad \begin{array}{c} \overset{6}{\lambda} \text{---} \overset{\overset{6}{\lambda}}{\underset{\underset{0}{\lambda}}{1}} \text{---} 0 \text{---} 0 \text{---} \overset{6}{\lambda} \end{array}$$
$$\begin{array}{ccccccc} \epsilon & \text{---} & \text{---} & \text{---} & \text{---} & \epsilon \\ \lambda & & & & & \lambda \\ & 0 & & 1 & & 0 & 0 \end{array}$$
[illegible]

0000100

$\overset{6}{\lambda}$ $\overset{6}{\lambda}$

0100100

$\overset{6}{\lambda}$ 0 1 0 0 1 0 0 $\overset{6}{\lambda}$

λ

Di - Vou

100 $\frac{\Delta}{\ddot{a}} \sim \frac{6}{\lambda} \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

$$\begin{array}{ccccccc} \Delta & & & & & & \epsilon \\ \mathfrak{A} & 1 & 0 & & 0 & & \lambda \end{array}$$

0100 $\begin{matrix} \Delta \\ \text{d} \end{matrix} \begin{matrix} \curvearrowright \\ 0 \end{matrix} \begin{matrix} \text{=} \\ 1 \end{matrix} \begin{matrix} \curvearrowright \\ 0 \end{matrix} \begin{matrix} \curvearrowright \\ 0 \end{matrix} \begin{matrix} \text{e} \\ \chi \end{matrix}$

$$\begin{array}{ccccccc} \Delta & & \circ & & \circ & & 6 \\ \partial & \searrow & \nearrow & \searrow & \nearrow & \searrow & \lambda \\ & 0 & 1 & & 0 & 0 & \end{array}$$

Δ
 α

1 0

$$\begin{array}{cc} \text{1} & \text{0} \\ \text{1} & \text{0} \end{array}$$

1

0

Fourth Mode - Sticheraric

00100

$\overset{\Delta}{\underset{\lambda}{\mathfrak{A}}} \curvearrowright \text{—} \overbrace{\text{—}}^{\text{—}} \overbrace{\text{—}}^{\text{—}} \overset{6}{\lambda}$
 0 0 1 0 0

$\overset{\Delta}{\underset{\lambda}{\mathfrak{A}}} \curvearrowright \text{—} \text{—} \overbrace{\text{—}}^{\text{—}} \overbrace{\text{—}}^{\text{—}} \overset{6}{\lambda}$
 0 0 1 0 0

$\text{—} \overbrace{\text{—}}^{\text{—}} \overbrace{\text{—}}^{\text{—}}$
 1

H) Accented on Fourth to Last Syllable

Pa - Vou

This section is small because the melody in this mode does not move from Pa to Vou in very many ways.

01010

0001010

Di - Vou

This section is also small because the melody in this mode does not move from Di to Vou in very many ways.

1010

1010

Medial Cadences on Di

I) Accented on Last Syllable

Pa - Di
$$001 \quad \pi \overline{0} \overline{0} \overline{1} \overline{\Delta}$$
$$\pi_q \xrightarrow{0} \xrightarrow{0} \xrightarrow{1} \Delta_{\mathcal{A}}$$


0001 π_q $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{\partial}$

$$10001 \quad \pi_q \quad \overline{10001} \quad \Delta_{\mathfrak{A}}$$

010001 π_q $\overbrace{0 \quad 1 \quad 0 \quad 0 \quad 0 \quad 1}^{\Delta}$ $\frac{\Delta}{\delta}$

$$100001 \quad \pi^q \quad \frac{\overline{u}}{1} \rightarrow \overline{u} \rightarrow \overline{u} \rightarrow \frac{\overline{u}}{0} \rightarrow \frac{\overline{u}}{0} \rightarrow \frac{\overline{u}}{1} \quad \frac{\Delta}{\mathfrak{A}}$$
$$110001 \quad \pi_q \quad \frac{f}{1} \rightarrow \frac{f}{1} \rightarrow \frac{f}{0} \rightarrow \frac{f}{0} \rightarrow \frac{f}{1} \rightarrow \frac{f}{1} \rightarrow \frac{f}{1}$$

X00001 π^q $\frac{\pi}{X}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{\Delta}$

0010001 π_q  Δ
0 0 1 0 0 0 1 \mathfrak{A}

$$\pi_q \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \Delta$$

0 0 1 0 0 0 1

π_q 0 1 0 0 0 0 1 $\frac{\Delta}{\delta}$

$$00010001 \quad \pi_q \quad \overbrace{0 \quad 0 \quad 0}^{\text{---}} \quad \underbrace{1 \quad 0 \quad 0}_{\text{---}} \quad 0 \quad 1 \quad \Delta_{\mathfrak{A}}$$

1

Fourth Mode - Sticheraric

001010001 π
 γ 0 0 1 0 1 0 0 0 1 Δ
 δ

000100011 π
 γ 0 0 0 1 0 0 0 1 1 Δ
 δ

Vou - Di

01 π
 γ 0 1 Δ
 δ

π
 γ 0 1 Δ
 δ

π
 γ 0 1 Δ
 δ

0001 π
 γ 0 0 0 1 Δ
 δ

π
 γ 0 0 0 1 Δ
 δ

0101 π
 γ 0 1 0 1 Δ
 δ

00001 π
 γ 0 0 0 0 1 Δ
 δ

10001 π
 γ 1 0 0 0 1 Δ
 δ

π
 γ 0 1 Δ
 δ

010001 π
 γ 0 1 0 0 0 1 Δ
 δ

π
 γ 0 1 0 0 0 1 Δ
 δ

π
 γ 0 1 0 0 0 1 Δ
 δ

Fourth Mode - Sticheraric

010X0X

λ

$$\underline{D_i - D_i}$$
$$00 \quad \overset{\Delta}{\underset{0}{\text{A}}} \quad \overset{\Delta}{\underset{0}{\text{B}}} \quad \overset{\Delta}{\underset{0}{\text{C}}}$$
$$00X \quad \begin{array}{c} \Delta \\ \text{A} \end{array} \quad \begin{array}{c} \Delta \\ \text{B} \end{array} \quad \begin{array}{c} \Delta \\ \text{C} \end{array} \quad \begin{array}{c} \Delta \\ \text{D} \end{array} \quad \begin{array}{c} \Delta \\ \text{E} \end{array}$$

001

Δ Δ Δ Δ

0 0 1

$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \text{A} & & & & & & \text{A} \\ \text{0} & & & & & & \text{1} \end{array}$$

0001 $\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$ $\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$ $\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$ $\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$ $\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$

$$\begin{array}{ccccccc} \Delta & \rightsquigarrow & \overline{\Gamma} & \rightsquigarrow & \overline{\Gamma} & \rightsquigarrow & \overline{\Gamma} \\ \mathfrak{d} & 0 & 0 & 0 & 1 & \mathfrak{d} \end{array}$$

X001 Δ χ $\overline{\chi}$ 0 0 1 Δ

00001

Δ
 δ 0 0 0 0 1 Δ
 δ

X0001

10001

Δ
 δ

1 0 0 0 1

Δ
 δ

1

Fourth Mode - Sticheraric

1 0 0 0 1

1 0 0 0 1

1

1 0 0 0 1

1 0 0 0 1

1 0 0 0 1

010001

0 1 0 0 0 1

010X0X

0 1 0 X 0 X

0 X

010001

0 1 0 0 0 1

0 1 0 0 0 1

1

1

1

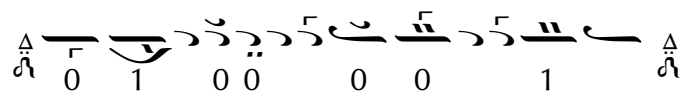
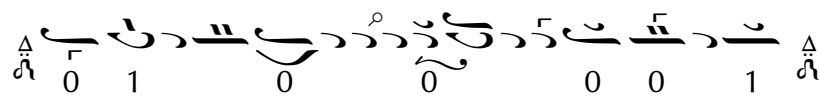
0100X0X

0 1 0 0 X 0 X

0 X

Fourth Mode - Sticheraric

0100001



J) Accented on Second to Last Syllable

Pa - Di

10 $\pi_q \overset{\sim}{\underset{1}{\text{—}}} \overset{\neg}{\text{—}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\Delta}{\mathfrak{A}}$

$\pi_q \overset{\sim}{\underset{1}{\text{—}}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\Delta}{\mathfrak{A}}$

$\pi_q \overset{\sim}{\underset{1}{\text{—}}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\Delta}{\mathfrak{A}}$

$\pi_q \overset{\sim}{\underset{1}{\text{—}}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\Delta}{\mathfrak{A}}$

010 $\pi_q \overset{\sim}{\underset{0}{\text{—}}} \overset{\sim}{\underset{1}{\text{—}}} \overset{\neg}{\text{—}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\Delta}{\mathfrak{A}}$

$\overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\Delta}{\mathfrak{A}}$

$\pi_q \overset{\sim}{\underset{0}{\text{—}}} \overset{\sim}{\underset{1}{\text{—}}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\Delta}{\mathfrak{A}}$

$\pi_q \overset{\sim}{\underset{0}{\text{—}}} \overset{\sim}{\underset{1}{\text{—}}} \overset{\neg}{\text{—}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\Delta}{\mathfrak{A}}$

$\pi_q \overset{\sim}{\underset{0}{\text{—}}} \overset{\sim}{\underset{1}{\text{—}}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\Delta}{\mathfrak{A}}$

$\pi_q \overset{\sim}{\underset{0}{\text{—}}} \overset{\sim}{\underset{1}{\text{—}}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\Delta}{\mathfrak{A}}$

$\pi_q \overset{\sim}{\underset{0}{\text{—}}} \overset{\sim}{\underset{1}{\text{—}}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\Delta}{\mathfrak{A}}$

0010 $\pi_q \overset{\sim}{\underset{0}{\text{—}}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\sim}{\underset{1}{\text{—}}} \overset{\neg}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\Delta}{\mathfrak{A}}$

0010 $\pi_q \overset{\sim}{\underset{0}{\text{—}}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\sim}{\underset{1}{\text{—}}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\Delta}{\mathfrak{A}}$

X0010 $\pi_q \overset{\sim}{\underset{X}{\text{—}}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\sim}{\underset{1}{\text{—}}} \overset{\sim}{\underset{0}{\text{—}}} \overset{\Delta}{\mathfrak{A}}$

Fourth Mode - Sticheraric

00010	π η	
		0 0 0 1 0 Δ η
	π η	
		0 0 0 1 0 Δ η
000010	π η	
		0 0 0 0 1 0 Δ η

Vou - Di

10	π η	
		1 0 Δ η
010	π η	
		0 1 0 Δ η
	π η	
		0 1 0 Δ η
	π η	
		0 1 0 Δ η
	π η	
		0 1 0 Δ η
0010	π η	
		0 0 1 0 Δ η
0X010	π η	
		0 X 0 1 0 Δ η
10010	π η	
		1 0 0 1 0 Δ η
	π η	
		1 0 0 1 0 Δ η
	π η	
		1 0 0 1 0 Δ η

Fourth Mode - Sticheraric

100010 $\overset{6}{\lambda} \overline{\underset{1}{\curvearrowright}} \underset{0}{\curvearrowright} \underset{0}{\curvearrowright} \overline{\underset{0}{\curvearrowright}} \underset{1}{\curvearrowright} \overline{\underset{0}{\curvearrowright}} \overset{\Delta}{\lambda}$

100010 $\overset{6}{\lambda} \overline{\underset{1}{\curvearrowright}} \underset{0}{\curvearrowright} \underset{0}{\curvearrowright} \underset{0}{\curvearrowright} \overline{\underset{1}{\curvearrowright}} \underset{0}{\curvearrowright} \overset{\Delta}{\lambda}$

0010010 $\overset{6}{\lambda} \overline{\underset{0}{\curvearrowright}} \underset{0}{\curvearrowright} \underset{1}{\curvearrowright} \underset{0}{\curvearrowright} \underset{0}{\curvearrowright} \underset{1}{\curvearrowright} \underset{0}{\curvearrowright} \overset{\Delta}{\lambda}$

00010010 $\overset{6}{\lambda} \underset{0}{\curvearrowright} \overline{\underset{0}{\curvearrowright}} \overline{\underset{0}{\curvearrowright}} \underset{1}{\curvearrowright} \underset{0}{\curvearrowright} \underset{0}{\curvearrowright} \underset{1}{\curvearrowright} \overline{\underset{0}{\curvearrowright}} \overset{\Delta}{\lambda}$

Di - Di

10 $\overset{\Delta}{\lambda} \overline{\underset{1}{\curvearrowright}} \overline{\underset{0}{\curvearrowright}} \overset{\Delta}{\lambda}$

$\overset{\Delta}{\lambda} \overline{\underset{1}{\curvearrowright}} \underset{0}{\curvearrowright} \overset{\Delta}{\lambda}$

$\overset{\Delta}{\lambda} \overline{\underset{1}{\curvearrowright}} \underset{1}{\curvearrowright} \underset{1}{\curvearrowright} \overline{\underset{0}{\curvearrowright}} \overset{\Delta}{\lambda}$

$\overset{\Delta}{\lambda} \overline{\underset{1}{\curvearrowright}} \underset{1}{\curvearrowright} \overline{\underset{1}{\curvearrowright}} \overline{\underset{1}{\curvearrowright}} \overline{\underset{0}{\curvearrowright}} \overset{\Delta}{\lambda}$

010 $\overset{\Delta}{\lambda} \overline{\underset{0}{\curvearrowright}} \overline{\underset{1}{\curvearrowright}} \underset{0}{\curvearrowright} \overset{\Delta}{\lambda}$

$\overset{\Delta}{\lambda} \overline{\underset{0}{\curvearrowright}} \underset{1}{\curvearrowright} \underset{0}{\curvearrowright} \overset{\Delta}{\lambda}$

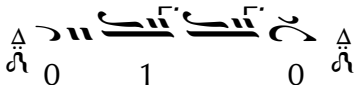
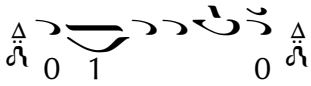

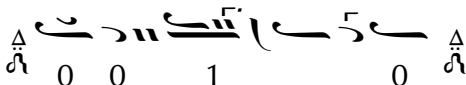
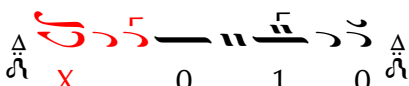

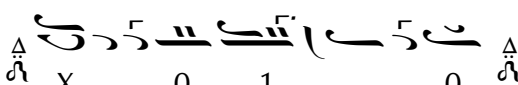


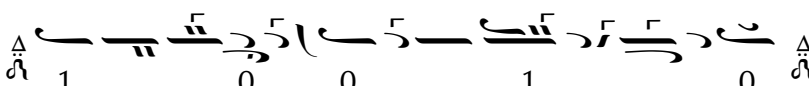
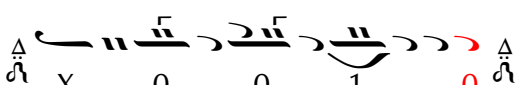
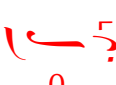
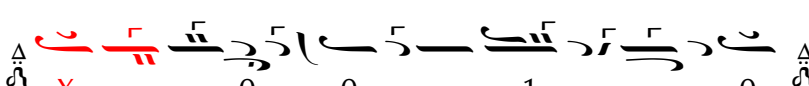
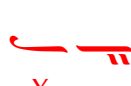
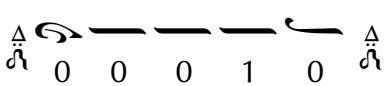
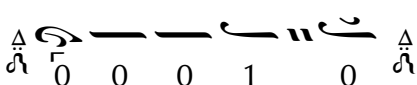
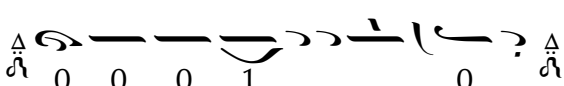
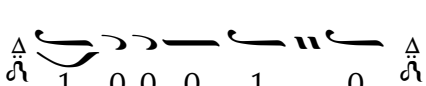
$\overset{\Delta}{\lambda} \overline{\underset{0}{\curvearrowright}} \underset{1}{\curvearrowright} \overline{\underset{0}{\curvearrowright}} \overset{\Delta}{\lambda}$

$\overline{\underset{0}{\curvearrowright}} \underset{0}{\curvearrowright}$

$\overset{\Delta}{\lambda} \overline{\underset{0}{\curvearrowright}} \underset{1}{\curvearrowright} \underset{0}{\curvearrowright} \overset{\Delta}{\lambda}$

$\overline{\underset{0}{\curvearrowright}}$

Fourth Mode - Sticheraric

		
		
		
0010		
X010		
		
10010		
		
X0010		
		
00010		
		
		
100010		

Fourth Mode - Sticheraric

010010

0100010

0010010

00010010

K) Accented on Third to Last Syllable

Pa - Di

100	$\pi_q \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\Delta}{\text{—}} \overset{\sim}{\text{—}}$
0010X	$\pi_q \text{—} \text{—} \text{—} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\Delta}{\text{—}} \overset{\sim}{\text{—}}$
00100	$\pi_q \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\text{—}} \overset{\sim}{\text{—}}$
10010X	$\pi_q \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \text{—} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\Delta}{\text{—}} \overset{\sim}{\text{—}}$
0100100	$\pi_q \text{—} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \text{—} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\Delta}{\text{—}} \overset{\sim}{\text{—}}$
00100100	$\pi_q \text{—} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \text{—} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\Delta}{\text{—}} \overset{\sim}{\text{—}}$

Vou - Di

100	$\overset{6}{\lambda} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\Delta}{\text{—}} \overset{\sim}{\text{—}}$
101	$\overset{6}{\lambda} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\text{—}} \overset{\sim}{\text{—}}$
0100	$\overset{6}{\lambda} \text{—} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\Delta}{\text{—}} \overset{\sim}{\text{—}}$
0101	$\overset{6}{\lambda} \text{—} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\Delta}{\text{—}} \overset{\sim}{\text{—}}$
10100	$\overset{6}{\lambda} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\Delta}{\text{—}} \overset{\sim}{\text{—}}$
010100	$\overset{6}{\lambda} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\text{—}} \overset{\sim}{\text{—}}$

Fourth Mode - Sticheraric

1010100

[illegible]
$$\underline{D_i - D_i}$$

100

$$\begin{array}{ccccc} \Delta & \text{---} & \text{---} & \text{---} & \Delta \\ \text{---} & & & & \text{---} \\ 1 & 0 & & 0 & \end{array}$$

0100

Δ
 \mathfrak{A}

0

$$\begin{array}{ccccccc} \Delta & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \Delta \\ \text{d} & \Gamma & & & & & \text{d} \\ 0 & 1 & 0 & 0 & & & \end{array}$$
$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \text{0} & & \text{1} & & \text{0} & \text{0} & \end{array}$$



1


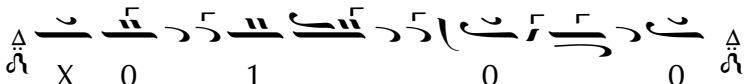
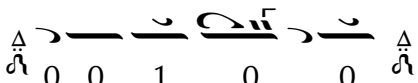
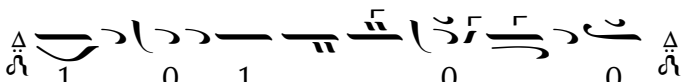

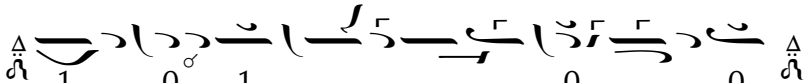
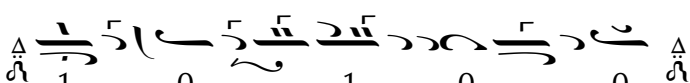
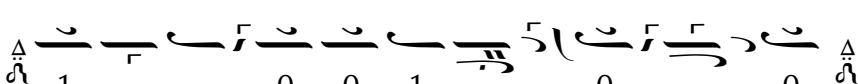
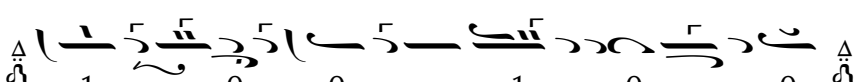
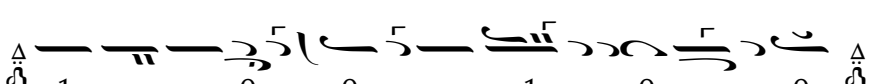
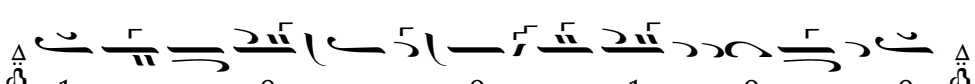
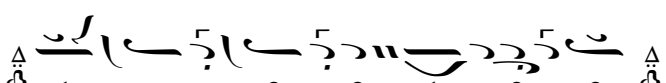
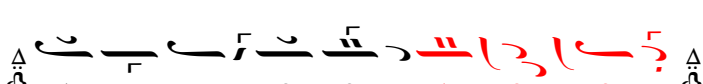

$$\begin{array}{ccccccc} \Delta & \overline{\text{u}} & \overline{\text{u}} & \text{s} & \text{s} & \text{c} & \Delta \\ \text{d} & 0 & 1 & 0 & 0 & & \text{d} \end{array}$$

Δ — Δ
 δ 0 1 0 0 δ

0

$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \text{♩} & \text{—} & \text{u} & \text{—} & \text{—} & \text{u} & \text{♩} \\ & 0 & & 1 & & 0 & 0 \end{array}$$
$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \mathfrak{A} & & & & & & \mathfrak{A} \\ 0 & 1 & & & 0 & & 0 \end{array}$$
[illegible]
$$\frac{5}{0}$$

Fourth Mode - Sticheraric

X100	 X 1 0 0
X0100	 X 0 1 0 0
00100	 0 0 1 0 0
10100	 1 0 1 0 0
	 1 0 1 0 0
	 1 0 1 0 0
	 1 0 1 0 0
100100	 1 0 0 1 0 0
	 1 0 0 1 0 0
	 1 0 0 1 0 0
	 1 0 0 1 0 0
	 1 0 0 1 0 0
	 1 0 0 1 0 0
	 1 0 1 0 0

Fourth Mode - Sticheraric

1 0 0

000100

 0 0 0 1 0 0

0010100

 0 0 1 0 1 0 0

0100100

 0 1 0 0 1 0 0

1000100

 1 0 0 0 1 0 0

1 0

1 0

1 0

1 0

1000100

 1 0 0 0 1 0 0

00100100

 0 0 1 0 0 1 0

0 0

0 0

0 0 1 0 0 1 0

01000100

 0 1 0 0 0 1 0

L) Accented on Fourth to Last Syllable

Pa - Di

1001	$\pi_q \frac{\overline{\cup}}{1} \curvearrowright \frac{\overline{\cap}}{0} \curvearrowright \frac{\overline{\cup}}{1} \Delta \mathfrak{A}$
	$\pi_q \overline{\cup} \text{---} \cup \Delta \mathfrak{A}$
1010	$\pi_q \cup \curvearrowright \overline{\cap} \overline{\cup} \overline{\cap} \overline{\cup} \overline{\cap} \overline{\cup} \Delta \mathfrak{A}$
01010	$\pi_q \text{---} \cup \curvearrowright \text{---} \overline{\cap} \overline{\cup} \Delta \mathfrak{A}$
01001	$\pi_q \overline{\cap} \overline{\cup} \overline{\cap} \overline{\cup} \overline{\cap} \overline{\cup} \Delta \mathfrak{A}$
	$\pi_q \text{---} \cup \curvearrowright \text{---} \overline{\cap} \overline{\cup} \Delta \mathfrak{A}$
001001	$\pi_q \text{---} \overline{\cap} \overline{\cup} \overline{\cap} \overline{\cup} \overline{\cap} \overline{\cup} \Delta \mathfrak{A}$
101001	$\pi_q \text{---} \cup \curvearrowright \overline{\cap} \overline{\cup} \overline{\cap} \overline{\cup} \Delta \mathfrak{A}$
0001001	$\pi_q \overline{\cap} \text{---} \text{---} \overline{\cap} \overline{\cup} \overline{\cap} \overline{\cup} \Delta \mathfrak{A}$
0101001	$\pi_q \overline{\cap} \text{---} \overline{\cap} \overline{\cup} \overline{\cap} \overline{\cup} \overline{\cap} \overline{\cup} \Delta \mathfrak{A}$
010001001	$\pi_q \overline{\cap} \text{---} \overline{\cap} \overline{\cup} \overline{\cap} \overline{\cup} \overline{\cap} \overline{\cup} \overline{\cap} \overline{\cup} \Delta \mathfrak{A}$

0 1 0

$\frac{1}{2}$	$\frac{1}{2}$
0	1

Vou - Di

Fourth Mode - Sticheraric

1001	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \end{array} \overset{\Delta}{\lambda}$ 1 0 0 1
	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \overset{\Delta}{\lambda}$ 1 0 0 1
01010	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \end{array} \overset{\Delta}{\lambda}$ 0 1 0 1 0
001001	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \overset{\Delta}{\lambda}$ 0 0 1 0 0 1
0101001	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \overset{\Delta}{\lambda}$ 0 1 0 1 0 0 1
0001001	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \overset{\Delta}{\lambda}$ 0 0 0 1 0 0 1
01001001	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \overset{\Delta}{\lambda}$ 0 1 0 0 1 0 0 1



Di - Di

100X	$\overset{\Delta}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \end{array} \overset{\Delta}{\lambda}$ 1 0 0 X
1001	$\overset{\Delta}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \end{array} \overset{\Delta}{\lambda}$ 1 0 0 1
	$\begin{array}{c} \text{—} \text{—} \text{—} \text{—} \end{array}$ 1 0 1
1010	$\overset{\Delta}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \end{array} \overset{\Delta}{\lambda}$ 1 0 1 0
	$\overset{\Delta}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \end{array} \overset{\Delta}{\lambda}$ 1 0 1 0
	$\overset{\Delta}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \end{array} \overset{\Delta}{\lambda}$ 1 0 1 0

Fourth Mode - Sticheraric

0

[illegible]

$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \mathfrak{A} & & & & & & \mathfrak{A} \\ \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 1 & & & 0 & 0 & 1 \end{array}$$
$$\begin{array}{ccccccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \mathfrak{A} & & \mathfrak{A} & & \mathfrak{A} & & \mathfrak{A} & & \mathfrak{A} & & \mathfrak{A} \\ 0 & & 0 & & 0 & & 1 & & 0 & & 0 & & 1 & & \mathfrak{A} \end{array}$$

M) Fthoras

Accented on last syllable:

$$001 \quad \pi_q \xrightarrow{0} \xrightarrow{0} \xrightarrow{1} \Delta$$
$$\Delta_{\mathfrak{A}} \xrightarrow{0} \xrightarrow{0} \xrightarrow{1} \xrightarrow{0} \dots$$

5

0001 $\begin{array}{c} \text{6} \\ \text{7} \end{array} \begin{array}{c} \text{0} \\ \text{0} \end{array} \begin{array}{c} \text{0} \\ \text{0} \end{array} \begin{array}{c} \text{1} \\ \text{1} \end{array} \Delta$

$$\begin{array}{ccccccc} \Delta & 4 & 5 & 6 & 7 & 8 & 9 \\ \delta_1 & 0 & 0 & 0 & 1 & 0 & 0 \end{array}$$
[illegible]
$$6_{\gamma} \xrightarrow{1} 0 \xrightarrow{0} 0 \xrightarrow{0} 1 \xrightarrow{1} 6_{\gamma}$$
$$\frac{6}{\lambda} \frac{J}{1} \frac{\gamma}{0} \frac{\gamma}{0} \frac{\gamma}{0} \frac{\gamma}{0} \frac{\gamma}{1} \frac{\gamma}{\lambda}$$
$$100001 \quad \begin{matrix} 6 \\ \lambda \end{matrix} \quad \begin{matrix} \text{hook} \\ 1 \end{matrix} \quad \begin{matrix} \text{hook} \\ 0 \end{matrix} \quad \begin{matrix} \text{hook} \\ 0 \end{matrix} \quad \begin{matrix} \text{hook} \\ 0 \end{matrix} \quad \begin{matrix} \text{hook} \\ 0 \end{matrix} \quad \begin{matrix} \text{hook} \\ 1 \end{matrix} \quad \begin{matrix} \gamma' \\ n \end{matrix}$$

1000101

π_q
 10010001

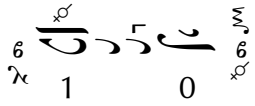



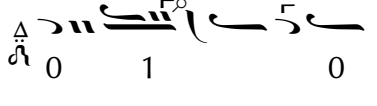
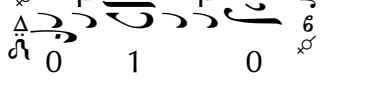
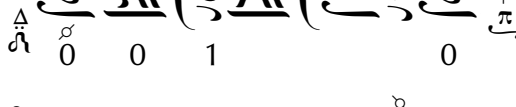
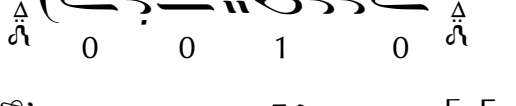
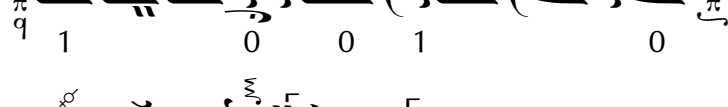
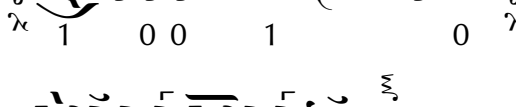
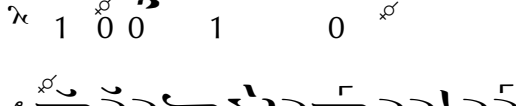
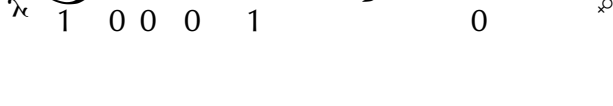
 1 0 0 1 0 0 0 1

10000010001 γ_6 $\frac{\sigma}{1}$ $\frac{\sigma}{0}$ $\frac{\sigma}{0}$ $\frac{\sigma}{0}$ $\frac{\sigma}{0}$ $\frac{\sigma}{0}$ $\frac{\sigma}{1}$ $\frac{\sigma}{0}$ $\frac{\sigma}{0}$ $\frac{\sigma}{0}$ $\frac{\sigma}{1}$ $\frac{\sigma}{\Delta}$

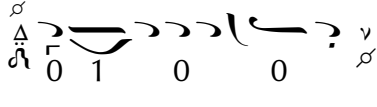
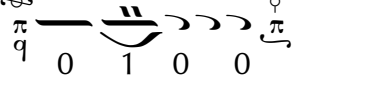
Accented on second to last syllable:

10 Δ 1 0 ν

Fourth Mode - Sticheraric

			
010			
			
			
			
0010			
			
10010			
			
			
100010			

Accented on third to last syllable:

0100	
	

Fourth Mode - Sticheraric

π_q 0 1 0 0

π_q 0 1 0 0 π_q

Δ 0 1 0 0 Δ

π_q 0 1 0 0 π_q

Δ 0 1 0 0 Δ

Δ 0 0 0 1 0 0 1 0 0

Δ 0 1 0 0 π_q

Δ 0 1 0 0 Δ

0

000100

Δ 0 0 0 1 0 0 Δ

00010100

Δ 0 0 0 1 0 1 0 0 Δ

000100100

Δ 0 0 0 1 0 0 1 0 0 Δ

Accented on fourth to last syllable:

1001

π_q 1 0 0 1 π_q

1010

π_q 1 0 1 0 Δ

Fourth Mode - Sticheraric

$$\begin{array}{ccccccc}
\begin{array}{c} \text{6} \\ \gamma \end{array} & \begin{array}{c} \text{5} \\ \text{1} \end{array} & \begin{array}{c} \text{5} \\ \text{0} \end{array} & \begin{array}{c} \text{5} \\ \text{1} \end{array} & \begin{array}{c} \text{5} \\ \text{0} \end{array} & \begin{array}{c} \text{5} \\ \text{0} \end{array} & \begin{array}{c} \text{5} \\ \text{0} \end{array}
\end{array}$$

01001

Δ

$\frac{1}{0} \sim \frac{1}{1} \sim \frac{1}{0} \sim \frac{1}{0} \sim \frac{1}{1}$

n'

01010

01001010

N) Medial Cadences on Low Di

Accented on last syllable:

(Use a formula ending in 100)

Accented on second to last syllable:

[illegible][illegible]
$$11010 \quad \pi_q \frac{\gamma}{1} \xrightarrow{\gamma} \frac{\gamma}{10} \xrightarrow{\gamma} \frac{\gamma}{1} \xrightarrow{\gamma} \frac{\gamma}{0} \xrightarrow{\gamma} \frac{\gamma}{\Delta} \xrightarrow{\gamma} \frac{\gamma}{0}$$
$$10010 \quad \pi_q \underbrace{\quad}_1 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_1 \underbrace{\quad}_0 \underbrace{\quad}_? \underbrace{\quad}_\Delta \underbrace{\quad}_0$$

Accented on third to last syllable:

X010X

— ۱۷۵ —
۱

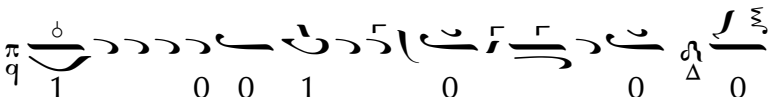
1 5

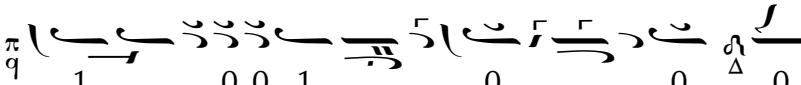
1-5-5-5

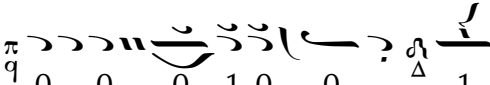
Diagram illustrating a sequence of nodes (0, 0, 1, 0, 0, 1) with associated weights or values (1, 0, 0, 1, 0, 1) and a final output (1). The sequence is labeled with πq and Δ .

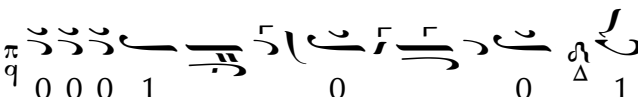
1. **Introduction**


Fourth Mode - Sticheraric

π_q  Δ 0

π_q  Δ 0

000100 π_q  Δ 1

000100 π_q  Δ 1

1000100 π_q  Δ 0

O) Old (slow) Sticheraric Formulae

Accented on last syllable:

[illegible]
$$01 \quad \begin{array}{ccccccc} & 6 & & 5 & & 5 & 6 \\ \lambda & 0 & & 1 & & 2 & \lambda \end{array}$$
[illegible][illegible][illegible]
$$001 \quad \pi_q \frac{\Gamma}{0} \rightarrow \frac{\Gamma}{0} \xrightarrow{5} \hookrightarrow \frac{\Gamma}{2} \xrightarrow{5} \frac{\Gamma}{1} \xrightarrow{2} \frac{\Gamma}{1} \xrightarrow{2} \frac{\Gamma}{1} \quad \pi_q$$
[illegible] γ_6 [illegible][illegible]

10001

$\Delta_{\vec{d}}$

1 0 0 0 1

π_q

0010001 π_q  π_q

Accented on second to last syllable:

$$10 \quad \pi_q \quad \frac{1}{1} \quad \frac{1}{2} \quad \frac{1}{3} \quad \frac{1}{4} \quad \frac{1}{5} \quad \frac{1}{6} \quad \frac{1}{7} \quad \frac{1}{8} \quad \frac{1}{9} \quad \frac{1}{10} \quad \pi_q$$
$$10 \quad \pi_q \frac{\zeta}{1} \frac{\Gamma}{\zeta} \rightarrow \frac{\zeta}{\pi} \frac{\Gamma}{\pi} \frac{\zeta}{\zeta} \rightarrow \frac{\Gamma}{0} \frac{\Delta}{\partial}$$

10 $\Delta_{\mathfrak{A}} \left(\frac{1}{1} \rightarrow \frac{0}{0} \xrightarrow{\sim} \frac{2}{2} \rightarrow \frac{0}{0} \xrightarrow{\sim} \frac{1}{1} \right) \Delta_{\mathfrak{A}}$

[illegible]
$$10 \quad \pi_q \left(\frac{1}{1} - \frac{\sqrt{5}}{5} - \frac{\sqrt{5}}{5} \right) = \frac{6}{\lambda}$$

10 $\gamma_1^6 \rightarrow \gamma_2^5 \rightarrow \gamma_3^4 \rightarrow \gamma_4^3 \rightarrow \gamma_5^2 \rightarrow \gamma_6^1$

[illegible]
$$010 \quad \pi_q \begin{array}{c} \curvearrowright \\ 0 \end{array} \begin{array}{c} \overline{\pi} \\ 1 \end{array} \begin{array}{c} \curvearrowright \\ \overline{\pi} \end{array} \begin{array}{c} \overline{\pi} \\ 0 \end{array} \begin{array}{c} \curvearrowright \\ \Delta \end{array}$$

010 $\begin{array}{c} \textcircled{6} \\ \gamma \end{array} \text{---} \textcircled{0} \text{---} \textcircled{1} \text{---} \textcircled{2} \text{---} \textcircled{3} \text{---} \textcircled{4} \text{---} \textcircled{5} \text{---} \textcircled{6} \text{---} \textcircled{7} \text{---} \textcircled{8} \text{---} \textcircled{9} \text{---} \textcircled{A}$

[illegible]

010

$\frac{\Delta}{\alpha} - \underbrace{u}_{0} \underbrace{v}_{1} - \underbrace{w}_{0} \underbrace{x}_{1} - \underbrace{y}_{0} \underbrace{z}_{1}$

٥٠٠

010

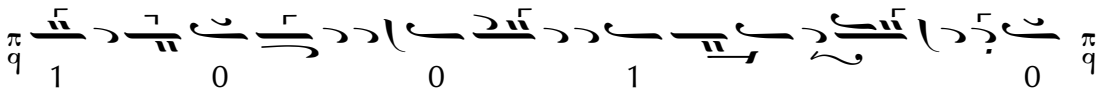


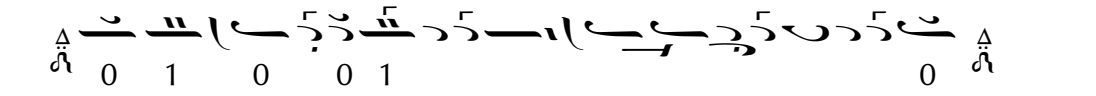
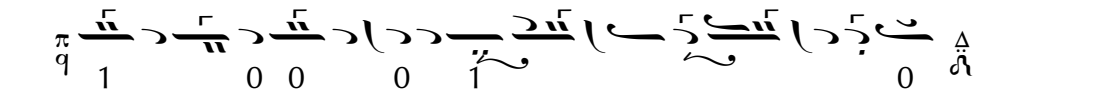
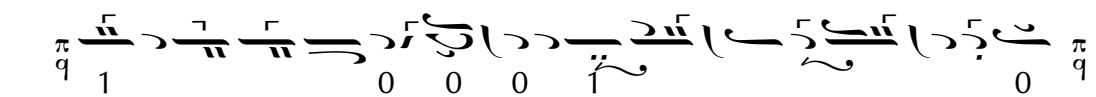
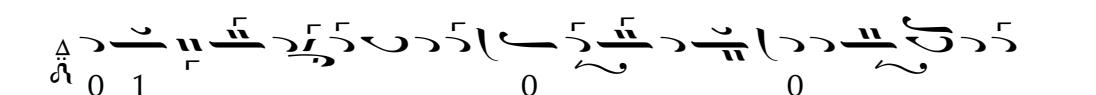

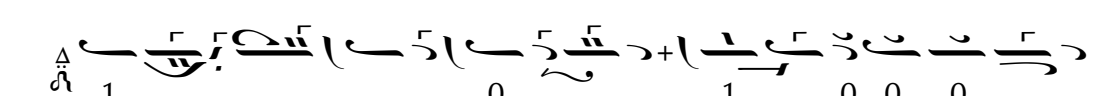
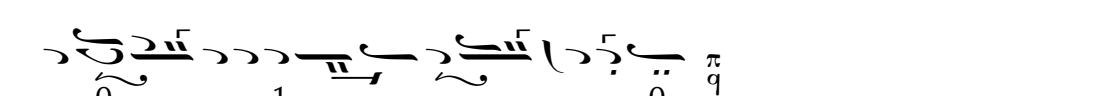


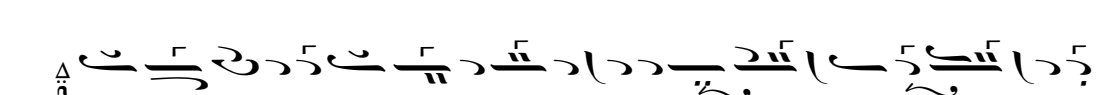
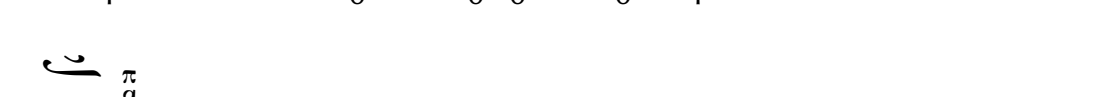
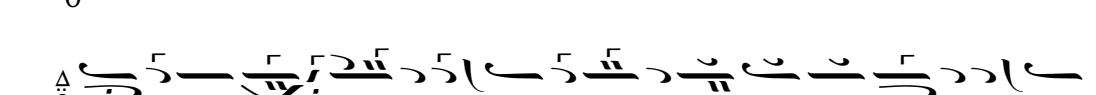
$\frac{\Delta}{\delta_0} \rightarrow \frac{1}{0}$

π_q

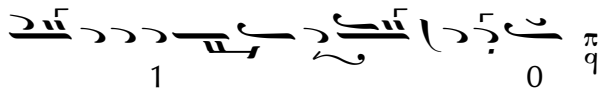
Fourth Mode - Sticheraric

[illegible]

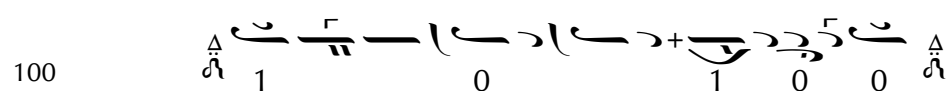
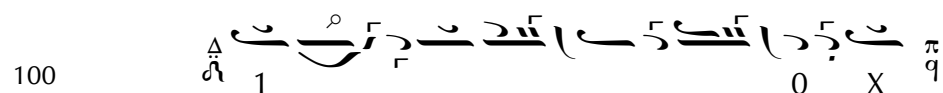
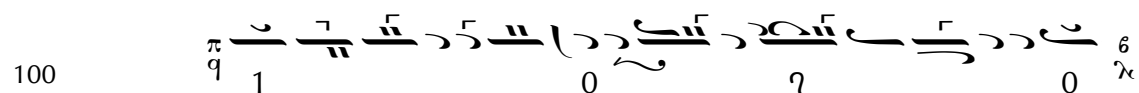
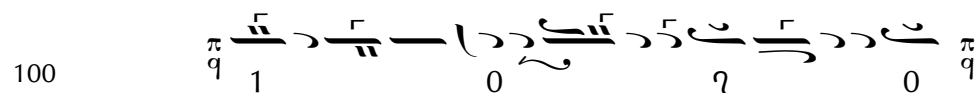
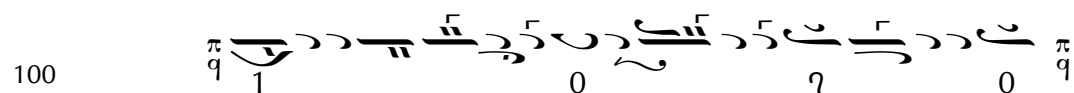
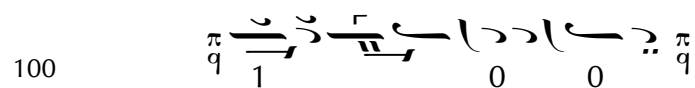
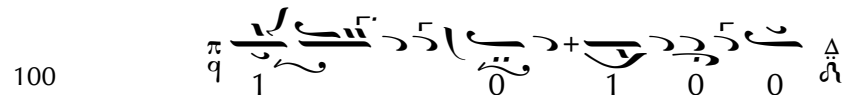
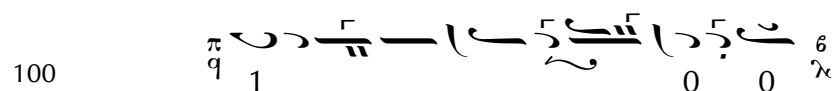
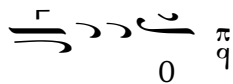
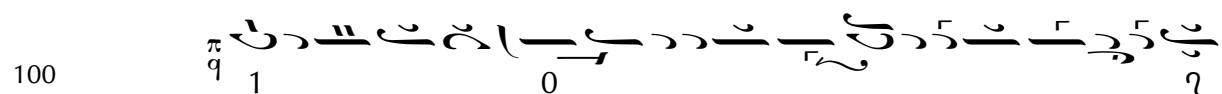
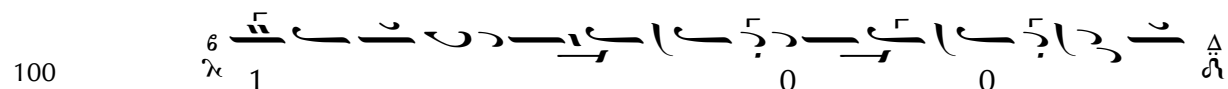
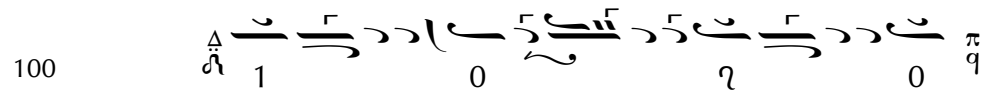
Fourth Mode - Sticheraric

10010	π_q  π_q 1 0 0 1 0
10010	π_q  π_q  1 0 0 1 0
010010	Δ  Δ 0 1 0 0 1
100010	π_q  Δ 1 0 0 0 1
100010	π_q  π_q 1 0 0 0 1
0100010	Δ  Δ 0 1 0 0 0
	 π_q 0 1 0
1000010	Δ  Δ 1 0 1 0 0 0
	 π_q 0 1 0
1000010	Δ  Δ 1 0 0 0 0 1
	 π_q 0
1000010	Δ  Δ 1 0 0 0 0 1
	 π_q 0
10000010	Δ  Δ 1 0 0 0 0 0

Fourth Mode - Sticheraric



Accented on third to last syllable:



Fourth Mode - Sticheraric

100 q_1 $\frac{1}{2}$ 0 $\frac{1}{2}$ 1 0 0 $\frac{1}{2}$

100 1 0 0 1

100

$$100 \quad \frac{\pi}{q} \quad \left(\frac{1}{1} \right) \quad \left(\frac{0}{0} \right) \quad \left(\frac{1}{1} \right) \quad \left(\frac{0}{0} \right) \quad \frac{\pi}{q}$$

101 λ 1 0 \sim 2 1 Δ

10X $\frac{1}{q}$ $\frac{1}{p}$ $\frac{1}{r}$ $\frac{1}{s}$ $\frac{1}{t}$ $\frac{1}{u}$ $\frac{1}{v}$ $\frac{1}{w}$ $\frac{1}{x}$ $\frac{1}{y}$ $\frac{1}{z}$

1. π is a prime number

0100 $\frac{\Delta}{\delta}$ 0 1 " (~ 0 0 1 0

$$\frac{\lambda}{0} \quad \lambda$$

0100 $\frac{\Delta}{\delta}$ 0 1 $\frac{\Delta}{\delta}$ 0 $\frac{\Delta}{\delta}$ 0 1 $\frac{\Delta}{\delta}$ 0 0 $\frac{\Delta}{\delta}$

$$1 + \underbrace{0}_0 \underbrace{-1}_{-1} \underbrace{+1}_{+1} \underbrace{-1}_{-1} \underbrace{+1}_{+1} \underbrace{-1}_{-1}$$

0

$\pi(q)$

0100 $\frac{\pi}{q}$ 0 1 $\frac{\pi}{q}$ 0 1 0 0 $\frac{\pi}{q}$

Fourth Mode - Sticheraric

[illegible]

00100

$\Delta_{\vec{A}} \frac{\overline{\text{III}}}{0} \rightarrow \frac{\text{II}}{0} \xrightarrow{\sim} \text{I} \xrightarrow{\sim} \frac{\overline{\text{III}}}{1} \leftarrow \frac{\overline{\text{IV}}}{0} \xrightarrow{\sim} \frac{\overline{\text{V}}}{0}$

π_q

$$00100 \quad \Delta \quad \frac{\overline{11}}{0} \rightarrow \frac{\overline{11}}{0} \rightarrow \frac{\overline{11}}{1} + \frac{\overline{11}}{0} \rightarrow \frac{\overline{11}}{0} \rightarrow \frac{\overline{11}}{1} \rightarrow \frac{\overline{11}}{0} \rightarrow \frac{\overline{11}}{0} \quad \pi q$$

00100

00100 $\begin{array}{cccccccc} \text{6} & & & & & & & \\ \gamma & 0 & 0 & 1 & & & & \end{array}$

$$\frac{\omega}{0} \approx \frac{6}{\lambda}$$
$$00100 \quad \pi_q \frac{\smile}{0} \frac{\cap}{0} \succ (\frac{\neg}{1} \frac{\neg}{1} \succ \frac{\sqcup}{1} \frac{\neg}{1} \frac{\sqcup}{0} \succ + \frac{\sqcup}{0} \frac{\cap}{0} \frac{\neg}{0} \frac{\neg}{1} \frac{\sqcup}{0} \succ \frac{\cap}{0} \frac{\sqcup}{0})$$
$$\frac{\lambda}{0} \lambda^6$$

00100 $\begin{matrix} \text{6} \\ \gamma \end{matrix} \begin{matrix} \text{1} \\ 0 \end{matrix} \begin{matrix} \text{2} \\ 0 \end{matrix} \begin{matrix} \text{3} \\ 1 \end{matrix} \begin{matrix} \text{4} \\ 0 \end{matrix} \begin{matrix} \text{5} \\ 0 \end{matrix} \begin{matrix} \text{6} \\ 0 \end{matrix} \begin{matrix} \text{7} \\ 1 \end{matrix} \begin{matrix} \text{8} \\ 0 \end{matrix} \begin{matrix} \text{9} \\ 0 \end{matrix} \pi$

$$00100 \quad \begin{array}{cccccccc} \text{6} & \text{5} & \text{4} & \text{3} & \text{2} & \text{1} & \text{0} & \text{6} \\ \text{7} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} & \text{1} & \text{7} \\ \text{7} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} & \text{1} & \text{7} \end{array}$$

010100 π_q π_q

100100

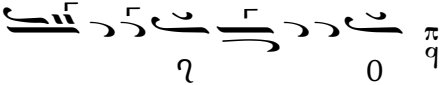
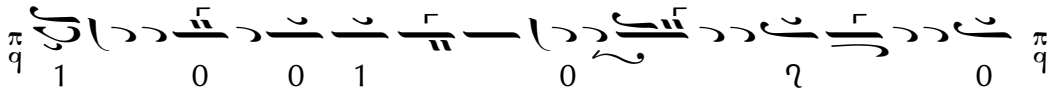
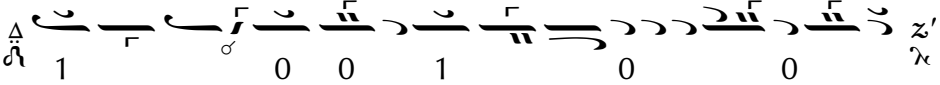
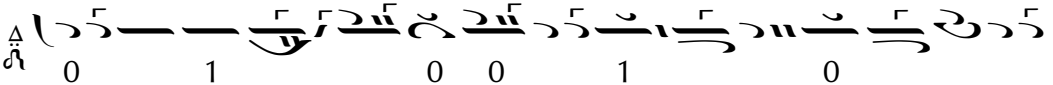
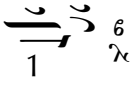

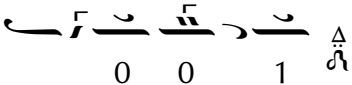
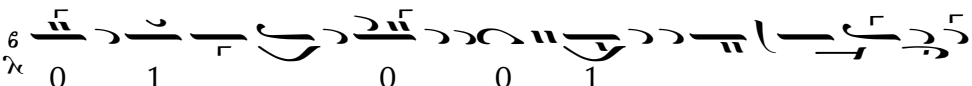


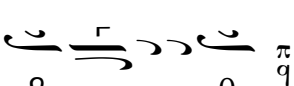
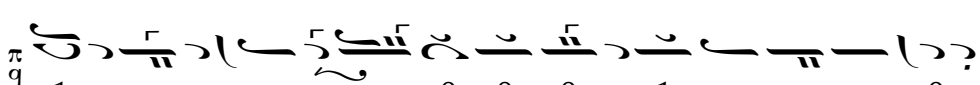

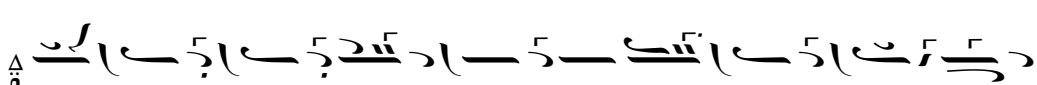
Δ
 δ

1 0 0 1 0

$$\frac{\pi}{q} \frac{1}{0}$$

100100 π_q 1 0 1 0

Fourth Mode - Sticheraric

	
100100	
100100	
0100101	
	
0010100	
	
0100100	
	
0100100	
	
1000100	
	
1000100	

Fourth Mode - Sticheraric

Accented on fourth to last syllable:

[illegible]

01001

γ_6

0 1

π_9

0 1

01001 Δ
 $\frac{2}{0} \rightarrow \frac{2}{1} \rightarrow \frac{2}{0} \rightarrow \frac{2}{0} \rightarrow \frac{2}{1}$ π_q

001001 π_q $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{1}$ π_q

Δ

001001

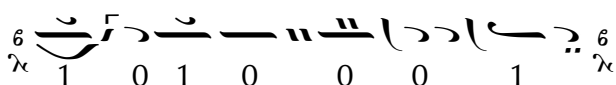
$\frac{\Delta}{\delta}$

0 0 1 0 0 1 π_q

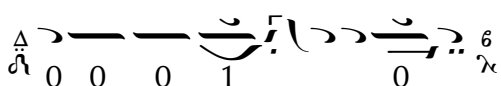
P) Final Cadences


Accented on last syllable:

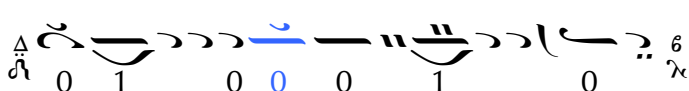
(Many formulae ending in 100, 10X, or X01 may also be appropriate)

1010001 

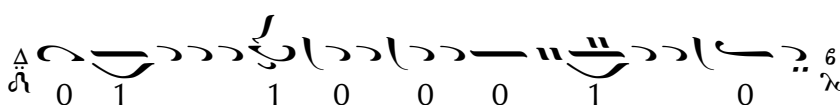
Accented on second to last syllable:*

0100010 


001010 

0100010 

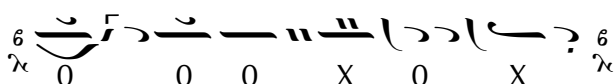


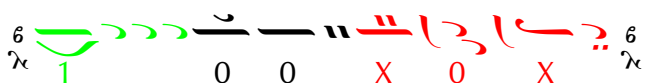
01100010 

Accented on third to last syllable:

X010X 

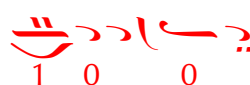


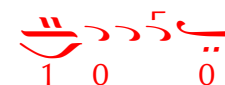
000X0X 

100X0X 





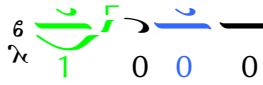


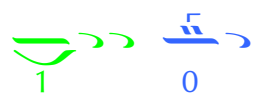
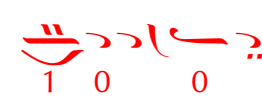
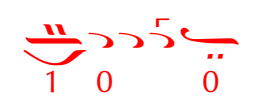


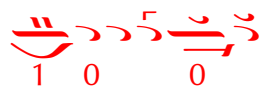
* Only four formulae in this section is accented on the second to last syllable because out of the dozens of sticheraric melodies we examined, we found only four that ended with a word accented on the second to last syllable. Nevertheless, by comparing them with the other formulae in this section, it is safe to deduce that the other formulae can be altered to accommodate phrases accented on the second to last syllable (or on the fourth to last syllable) merely by removing the second to last syllable in them.

Fourth Mode - Sticheraric


1000X0X


$\overset{6}{\lambda}$  $\overset{6}{\lambda}$





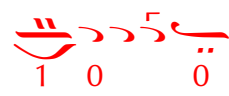
0010X0X

$\overset{\Delta}{\lambda}$  $\overset{6}{\lambda}$

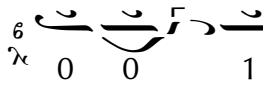


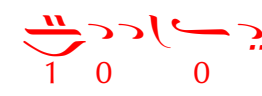
0010100

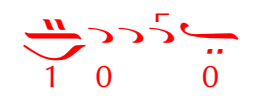
$\overset{\Delta}{\lambda}$  



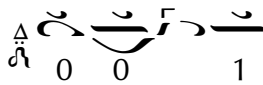
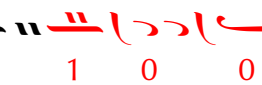
0010X0X

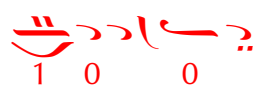
$\overset{6}{\lambda}$  $\overset{6}{\lambda}$

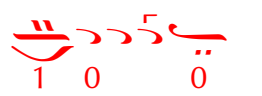





0010100


$\overset{\Delta}{\lambda}$  







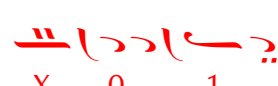
01010X01

$\overset{\pi}{\eta}$  $\overset{6}{\lambda}$

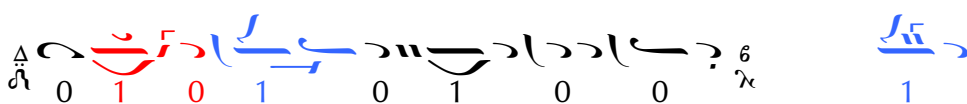


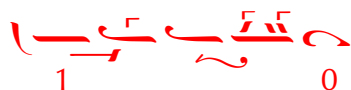
01010X01

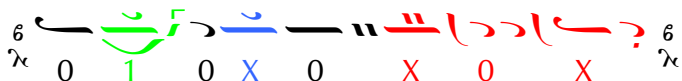
$\overset{\Delta}{\lambda}$  



Fourth Mode - Sticheraric

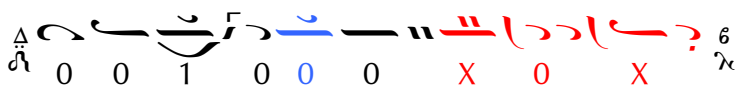
01010100 



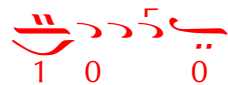
010X0X0X 

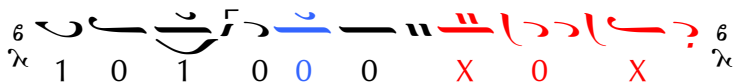




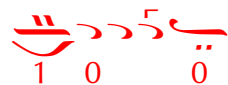
001000X0X 



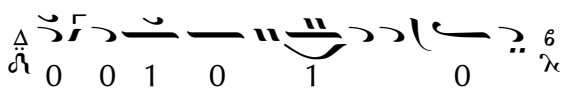


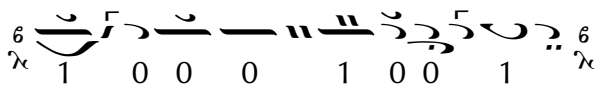
101000X0X 





Accented on fourth to last syllable:

001010 

10001001 

Q) Final Cadences for Theotokia

01001

100100

1000100

1000101

1000101

Old (slow) Sticheric Cadences for Theotokia:

100

00100

BYZANTINE MUSIC FORMULAE

Fourth Mode - Heirmologic (Legetos)

Contents^{*}

A) Cadences on Pa.....	336
B) Cadences on Vou.....	340
C) Cadences on Di	351
D) Formulae with Fthores	364
E) Endings for Theotokia	366

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

* The Byzantine music formulae herein were extracted from all the heirmologic melodies found in the Zoe Anastasimatarion (14th edition, 2002).

Fourth Mode - Heirmologic (Legetos)

A) Medial Cadences on Pa

Accented on last syllable:

From Pa

0 $\begin{array}{c} \pi \\ \text{q} \end{array} \overline{\quad} \overline{\quad} \begin{array}{c} \pi \\ \text{q} \end{array}$
 0 0

Accented on second to last syllable:

From Pa

01000010 $\begin{array}{c} \pi \\ \text{q} \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \pi \\ \text{q} \end{array}$
 0 1 0 0 0 0 1 0

From Vou

X010 $\begin{array}{c} 6 \\ \lambda \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \pi \\ \text{q} \end{array}$
 X 0 1 0

X0010 $\begin{array}{c} 6 \\ \lambda \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \pi \\ \text{q} \end{array}$
 X 0 0 1 0

010010 $\begin{array}{c} 6 \\ \lambda \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \pi \\ \text{q} \end{array}$
 0 1 0 0 1 0

0010010 $\begin{array}{c} 6 \\ \lambda \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \pi \\ \text{q} \end{array}$
 0 0 1 0 0 1 0

0100010 $\begin{array}{c} 6 \\ \lambda \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \pi \\ \text{q} \end{array}$
 0 1 0 0 0 1 0

$\overline{\quad} \overline{\quad}$
 1 0

1000010 $\begin{array}{c} 6 \\ \lambda \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \pi \\ \text{q} \end{array}$
 1 0 0 0 0 1 0

00010010 $\begin{array}{c} 6 \\ \lambda \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \pi \\ \text{q} \end{array}$
 0 0 0 1 0 0 1 0

00100010 $\begin{array}{c} 6 \\ \lambda \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \pi \\ \text{q} \end{array}$
 0 0 1 0 0 0 1 0

Fourth Mode - Heirmologic (Legetos)

000010010

λ 0 0 0 0 1 0 0 1 0 π

$$100010010 \quad \begin{matrix} \overset{6}{\lambda} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \overset{\pi}{q} \\ \underset{1}{\lambda} & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 \end{matrix}$$

λ

0001000010

π

0 0 0 1 0 0 0 0 1 0

0010010010 $\overset{6}{\underset{\gamma}{\curvearrowright}} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{\pi}{\underset{q}{\curvearrowright}}$

λ

6
1001000010

π

9

1 0 0 1 0 0 0 0 1 0

1 0

[illegible]

From Di

0010010

0 0 1 0 0 1 0

Accented on third to last syllable:

From You

$$0100 \quad \begin{array}{cccc} \begin{array}{c} 6 \\ \gamma_\kappa \end{array} & \text{---} & \text{---} & \text{---} & \begin{array}{c} \pi \\ q \end{array} \\ & 0 & 1 & 0 & 0 \end{array}$$
$$10100 \quad \begin{matrix} \gamma^6 & \gamma^5 & \gamma^4 & \gamma^3 & \gamma^2 & \gamma^1 & \gamma^0 \\ \gamma^{\kappa} & 1 & 0 & 1 & 0 & 0 & \gamma^{\eta} \end{matrix}$$
$$100100 \quad \begin{array}{c} \overset{6}{\lambda} \quad \text{---} \quad \overset{7}{\lambda} \quad \text{---} \quad \overset{8}{\lambda} \quad \text{---} \quad \overset{9}{\lambda} \\ 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \end{array} \quad \pi^9$$
$$1000100 \quad \begin{matrix} \overset{6}{\lambda} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \overset{\pi}{q} \\ & 1 & 0 & 0 & 0 & 1 & 0 & 0 \end{matrix}$$
$$00100100 \quad \begin{array}{ccccccc} \overset{6}{\curvearrowright} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \overset{5}{\curvearrowright} \\ \underset{\lambda}{0} & \underset{0}{0} & \underset{1}{1} & \underset{0}{0} & \underset{0}{0} & \underset{1}{1} & \underset{0}{0} \end{array} \quad \begin{array}{c} \pi \\ q \end{array}$$

Fourth Mode - Heirmologic (Legetos)

000100100	$\overset{6}{\lambda} \text{ — — — — — } \pi \text{ q}$ 0 0 0 1 0 0 1 0 0
001000100	$\overset{6}{\lambda} \text{ — — — — — } \pi \text{ q}$ 0 0 1 0 0 0 1 0 0
100100100	$\overset{6}{\lambda} \text{ — — — — — } \pi \text{ q}$ 1 0 0 1 0 0 1 0 0
1000100100	$\overset{6}{\lambda} \text{ — — — — — } \pi \text{ q}$ 1 0 0 0 1 0 0 1 0 0
	$\overset{6}{\lambda} \text{ — — — — — } \pi \text{ q}$ 1 0 0 0 1 0 0 1 0 0
0010100100	$\overset{6}{\lambda} \text{ — — — — — } \pi \text{ q}$ 0 0 1 0 1 0 0 1 0 0
00100100100	$\overset{6}{\lambda} \text{ — — — — — } \pi \text{ q}$ 0 0 1 0 0 1 0 0 1 0 0

From Di



















100	$\overset{\Delta}{\lambda} \text{ — — — } \pi \text{ q}$ 1 0 0
100100	$\overset{\Delta}{\lambda} \text{ — — — — — } \pi \text{ q}$ 1 0 0 1 0 0

Accented on fourth to last syllable:

From Vou

1001	$\overset{6}{\lambda} \text{ — — — } \pi \text{ q}$ 1 0 0 1
1010	$\overset{6}{\lambda} \text{ — — — } \pi \text{ q}$ 1 0 1 0
01X00	$\overset{6}{\lambda} \text{ — — — } \pi \text{ q}$ 0 1 X 0 0

Fourth Mode - Heirmologic (Legetos)

1001010	$\overset{6}{\lambda}$							$\overset{\pi}{q}$
		1	0	0	1	0	1	0
0001010	$\overset{6}{\lambda}$							$\overset{\pi}{q}$
		0	0	0	1	0	1	0
0010001001	$\overset{6}{\lambda}$							$\overset{\pi}{q}$
		0	0	1	0	0	0	1

Fourth Mode - Heirmologic (Legetos)

B) Medial Cadences on Vou

Note: These formulae are also used for final cadences.

Also note that for the rest of these formulae in heirmologic fourth mode, formulae from Pa can be created by merely taking a formula from Vou and increasing the initial jump by one.

Accented on last syllable:

From Pa

000 $\begin{array}{c} \pi \\ \gamma \end{array} \overbrace{0 \ 0 \ 0}^{\text{—}} \begin{array}{c} \delta \\ \gamma \end{array}$

From Vou

1 $\begin{array}{c} \delta \\ \gamma \end{array} \overbrace{1}^{\text{—}} \begin{array}{c} \delta \\ \gamma \end{array}$

00 $\begin{array}{c} \delta \\ \gamma \end{array} \overbrace{0 \ 0}^{\text{—}} \begin{array}{c} \delta \\ \gamma \end{array}$

000 $\begin{array}{c} \delta \\ \gamma \end{array} \overbrace{0 \ 0 \ 0}^{\text{—}} \begin{array}{c} \delta \\ \gamma \end{array}$

0000 $\begin{array}{c} \delta \\ \gamma \end{array} \overbrace{0 \ 0 \ 0 \ 0}^{\text{—}} \begin{array}{c} \delta \\ \gamma \end{array}$

10001 $\begin{array}{c} \delta \\ \gamma \end{array} \overbrace{1 \ 0 \ 0 \ 0}^{\text{—}} \overbrace{1}^{\text{—}} \begin{array}{c} \delta \\ \gamma \end{array}$

$\begin{array}{c} \delta \\ \gamma \end{array} \overbrace{1 \ 0 \ 0 \ 0}^{\text{—}} \overbrace{1}^{\text{—}} \begin{array}{c} \delta \\ \gamma \end{array}$

010001 $\begin{array}{c} \delta \\ \gamma \end{array} \overbrace{0 \ 1 \ 0 \ 0 \ 0}^{\text{—}} \overbrace{1}^{\text{—}} \begin{array}{c} \delta \\ \gamma \end{array}$

$\overbrace{0 \ 1}^{\text{—}}$

100001 $\begin{array}{c} \delta \\ \gamma \end{array} \overbrace{1 \ 0 \ 0 \ 0 \ 0}^{\text{—}} \overbrace{1}^{\text{—}} \begin{array}{c} \delta \\ \gamma \end{array}$

$\begin{array}{c} \delta \\ \gamma \end{array} \overbrace{1 \ 0 \ 0 \ 0 \ 0}^{\text{—}} \overbrace{1}^{\text{—}} \begin{array}{c} \delta \\ \gamma \end{array}$

Fourth Mode - Heirmologic (Legetos)

0010001 $\overset{6}{\lambda} \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \overset{6}{\lambda}$
 0 0 1 0 0 0 1

$\overset{6}{\lambda} \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \overset{6}{\lambda}$
 0 0 1 0 0 0 1

0100001 $\overset{6}{\lambda} \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \overset{6}{\lambda}$
 0 1 0 0 0 0 1

0110001 $\overset{6}{\lambda} \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \overset{6}{\lambda}$
 0 1 1 0 0 0 1

1010001 $\overset{6}{\lambda} \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \overset{6}{\lambda}$
 1 0 1 0 0 0 1

00010001 $\overset{6}{\lambda} \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \overset{6}{\lambda}$
 0 0 0 1 0 0 0 1

10010001 $\overset{6}{\lambda} \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \overset{6}{\lambda}$
 1 0 0 1 0 0 0 1

From Di

10001 $\overset{\Delta}{\text{d}} \text{ — } \text{ — } \text{ — } \text{ — } \overset{6}{\lambda}$
 1 0 0 0 1

$\overset{\Delta}{\text{d}} \text{ — } \text{ — } \text{ — } \text{ — } \overset{6}{\lambda}$
 1 0 0 0 1

$\overset{\Delta}{\text{d}} \text{ — } \text{ — } \text{ — } \text{ — } \overset{6}{\lambda}$
 1 0 0 0 1

010001 $\overset{\Delta}{\text{d}} \text{ — } \text{ — } \text{ — } \text{ — } \overset{6}{\lambda}$
 0 1 0 0 0 1

100001 $\overset{\Delta}{\text{d}} \text{ — } \text{ — } \text{ — } \text{ — } \overset{6}{\lambda}$
 1 0 0 0 0 1

0100001 $\overset{\Delta}{\text{d}} \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \overset{6}{\lambda}$
 0 1 0 0 0 0 1

Fourth Mode - Heirmologic (Legetos)

$\overset{\Delta}{\underset{\text{d}\lambda}{\text{A}}} \rightarrow \overset{\text{6}}{\underset{\lambda}{\text{1}}} \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \overset{\text{6}}{\underset{\lambda}{\text{1}}}$
 0 1 0 0 0 0 1

$\overset{\text{6}}{\underset{\lambda}{\text{1}}} \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \overset{\text{6}}{\underset{\lambda}{\text{1}}}$
 1 1

1010001
 $\overset{\Delta}{\underset{\text{d}\lambda}{\text{A}}} \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \overset{\text{6}}{\underset{\lambda}{\text{1}}}$
 1 0 1 0 0 0 1

010X0001
 $\overset{\Delta}{\underset{\text{d}\lambda}{\text{A}}} \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \overset{\text{6}}{\underset{\lambda}{\text{1}}}$
 0 1 0 X 0 0 0 1

Accented on second to last syllable:

From Pa

0
 $\overset{\pi}{\underset{\eta}{\text{q}}} \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \overset{\text{6}}{\underset{\lambda}{\text{1}}}$
 0

10
 $\overset{\pi}{\underset{\eta}{\text{q}}} \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \overset{\text{6}}{\underset{\lambda}{\text{1}}}$
 1 0

010
 $\overset{\pi}{\underset{\eta}{\text{q}}} \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \overset{\text{6}}{\underset{\lambda}{\text{1}}}$
 0 1 0

0100010
 $\overset{\pi}{\underset{\eta}{\text{q}}} \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \overset{\text{6}}{\underset{\lambda}{\text{1}}}$
 0 1 0 0 0 1 0

From Vou

0010
 $\overset{\text{6}}{\underset{\lambda}{\text{1}}} \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \overset{\text{6}}{\underset{\lambda}{\text{1}}}$
 0 0 1 0

0101000010
 $\overset{\text{6}}{\underset{\lambda}{\text{1}}} \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \overset{\text{6}}{\underset{\lambda}{\text{1}}}$
 0 1 0 1 0 0 0 0 1 0

From Di

0010
 $\overset{\Delta}{\underset{\text{d}\lambda}{\text{A}}} \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \overset{\text{6}}{\underset{\lambda}{\text{1}}}$
 0 0 1 0

Fourth Mode - Heirmologic (Legetos)


	$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}} \begin{array}{c} \text{blue} \quad \text{blue} \quad \text{red} \quad \text{red} \\ 0 \quad 0 \quad 1 \quad 0 \end{array} \overset{6}{\underset{\gamma}{\lambda}}$
	$\begin{array}{c} \text{blue} \quad \text{blue} \quad \text{red} \quad \text{red} \\ 0 \quad 0 \quad 1 \quad 0 \end{array}$
	$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}} \begin{array}{c} \text{black} \quad \text{black} \quad \text{black} \quad \text{black} \\ 0 \quad 0 \quad 1 \quad 0 \end{array} \overset{6}{\underset{\gamma}{\lambda}}$
00010	$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}} \begin{array}{c} \text{black} \quad \text{black} \quad \text{black} \quad \text{black} \\ 0 \quad 0 \quad 0 \quad 1 \end{array} \overset{6}{\underset{\gamma}{\lambda}}$
10010	$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}} \begin{array}{c} \text{black} \quad \text{black} \quad \text{black} \quad \text{black} \\ 1 \quad 0 \quad 0 \quad 1 \end{array} \overset{6}{\underset{\gamma}{\lambda}}$
	$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}} \begin{array}{c} \text{red} \quad \text{black} \quad \text{black} \quad \text{blue} \quad \text{blue} \\ 1 \quad 0 \quad 0 \quad 1 \quad 0 \end{array} \overset{6}{\underset{\gamma}{\lambda}}$
	$\begin{array}{c} \text{red} \quad \text{blue} \quad \text{blue} \\ 1 \quad 1 \quad 0 \end{array}$
	$\begin{array}{c} \text{blue} \quad \text{blue} \quad \text{blue} \quad \text{blue} \\ 1 \quad \quad \quad 0 \end{array}$
0X0010	$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}} \begin{array}{c} \text{black} \quad \text{black} \quad \text{blue} \quad \text{red} \quad \text{red} \\ 0 \quad X \quad 0 \quad 0 \quad 1 \end{array} \overset{6}{\underset{\gamma}{\lambda}}$
	$\begin{array}{c} \text{blue} \quad \text{red} \quad \text{red} \\ 0 \quad 1 \quad 0 \end{array}$
010010	$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}} \begin{array}{c} \text{black} \quad \text{black} \quad \text{black} \quad \text{red} \quad \text{black} \quad \text{black} \\ 0 \quad 1 \quad 0 \quad 0 \quad 1 \end{array} \overset{6}{\underset{\gamma}{\lambda}}$
	$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}} \begin{array}{c} \text{black} \quad \text{black} \quad \text{black} \quad \text{black} \quad \text{black} \quad \text{black} \\ 0 \quad 1 \quad 0 \quad 0 \quad 1 \end{array} \overset{6}{\underset{\gamma}{\lambda}}$
10X010	$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}} \begin{array}{c} \text{black} \quad \text{black} \quad \text{black} \quad \text{red} \quad \text{red} \\ 1 \quad 0 \quad X \quad 0 \quad 1 \end{array} \overset{6}{\underset{\gamma}{\lambda}}$
	$\begin{array}{c} \text{red} \quad \text{red} \\ 1 \quad 0 \end{array}$


Fourth Mode - Heirmologic (Legetos)


1 0



1 0


1 0

0000010 
0 0 0 0 0 1 0 ⁶_λ

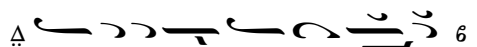
0010010 
0 0 1 0 0 1 0 ⁶_λ


0

1000010 
1 0 0 0 0 1 0 ⁶_λ

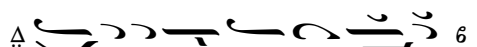
1010010 
1 0 1 0 0 1 0 ⁶_λ



0


00000010 
0 0 0 0 0 0 1 0 ⁶_λ


01000010 
0 1 0 0 0 0 1 0 ⁶_λ


1 0 0 1 0

10000010 
1 0 0 0 0 0 1 0 ⁶_λ

01010010 
0 1 0 1 0 0 1 0 ⁶_λ

10010010 
1 0 0 1 0 0 1 0 ⁶_λ

100100010 
1 0 0 1 0 0 0 1 0 ⁶_λ

Fourth Mode - Heirmologic (Legetos)

Accented on third to last syllable:

From Vou

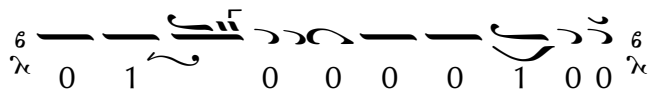
100	$\overset{6}{\lambda} \underbrace{\text{—}}_{1} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda}$	$\overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda}$
	$\overset{6}{\lambda} \underbrace{\text{—}}_{1} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda}$	
	$\overset{6}{\lambda} \underbrace{\text{—}}_{1} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda}$	
10100	$\overset{6}{\lambda} \underbrace{\text{—}}_{1} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda}$	
0X0100	$\overset{6}{\lambda} \underbrace{\text{—}}_{0} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda}$	
0X010X	$\overset{6}{\lambda} \underbrace{\text{—}}_{0} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda}$	
0100100	$\overset{6}{\lambda} \underbrace{\text{—}}_{0} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda}$	
	$\overset{6}{\lambda} \underbrace{\text{—}}_{0} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda}$	
10100100	$\overset{6}{\lambda} \underbrace{\text{—}}_{1} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda}$	$\overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda}$
	$\overset{6}{\lambda} \underbrace{\text{—}}_{1} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda}$	
100010100	$\overset{6}{\lambda} \underbrace{\text{—}}_{1} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda}$	
100100100	$\overset{6}{\lambda} \underbrace{\text{—}}_{1} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda} \overset{6}{\lambda}$	

Fourth Mode - Heirmologic (Legetos)



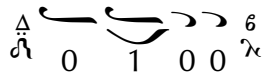
 1 0 1

010000100



From Di

0100

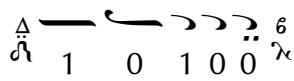


00100





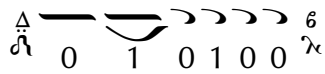
10100





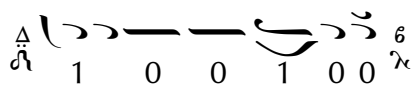
010100





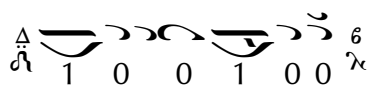


100100

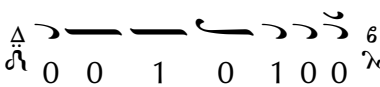


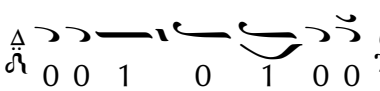


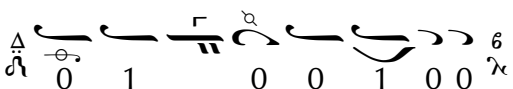


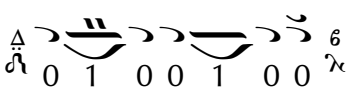


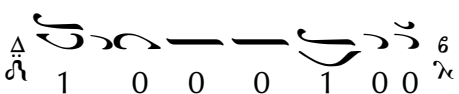
Fourth Mode - Heirmologic (Legetos)

0010100 



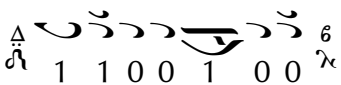
0100100 

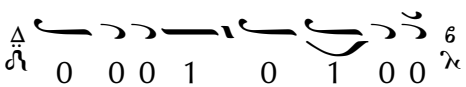


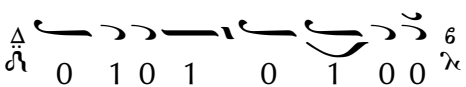
1000100 

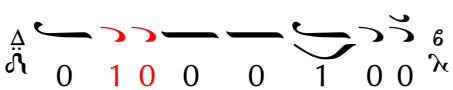


10X0100 

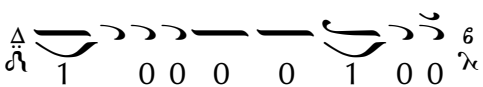
1100100 

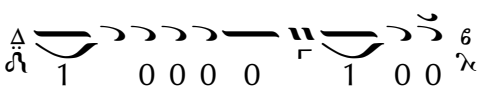
00010100 

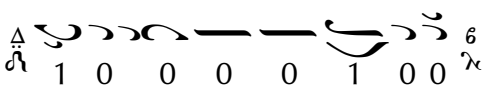
01010100 

01000100 



10000100 





Fourth Mode - Heirmologic (Legetos)

10010100

10100100

1

100010100

100100100

Accented on fourth to last syllable:

From Pa

01001

From Vou

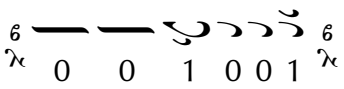
1000

1010

01001


01010

Fourth Mode - Heirmologic (Legetos)

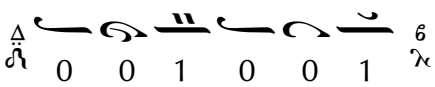
001001 



From Di

1001 

1010  

01001  

001001 

001010  

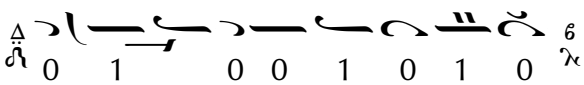
10X010 

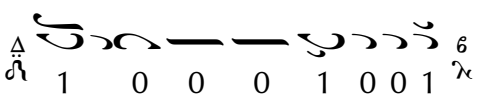






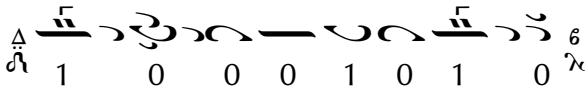


01001010 

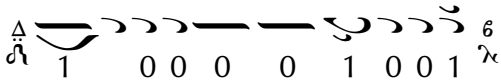
10001001 

Fourth Mode - Heirmologic (Legetos)

10001010



100001001



C) Medial Cadences on Di

Accented on last syllable:

From Pa

$$00 \quad \pi_q \frac{1}{0} \frac{1}{0} \frac{\Delta}{\mathfrak{A}}$$

01 $\pi_q \quad \frac{1}{0} \quad \frac{1}{1} \quad \frac{\Delta}{\mathfrak{A}}$

$$001 \quad \pi \overline{0} \overline{0} \overline{1} \Delta \overline{\overline{0}}$$
$$0001 \quad \pi_q \overbrace{0 \quad 0 \quad 0 \quad 1}^{\Delta}$$

100001

π_q 1 0 0 0 0 1 $\frac{\Delta}{\delta}$

π

0010001

0 0 1 0 0 0 1

Δ

From You

$$000 \quad \begin{array}{c} \epsilon \\ \lambda \end{array} \overline{\quad} \overline{\quad} \overline{\quad} \begin{array}{c} \Delta \\ \mathfrak{A} \end{array}$$

001 $\overset{6}{\lambda}$ 0 0 1 $\overset{\Delta}{\mathfrak{A}}$

0001

λ 0 0 0 1 Δ

00001

$\begin{matrix} \overset{6}{\gamma} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \overset{\Delta}{\delta} \\ & 0 & 0 & 0 & 0 & 1 & \end{matrix}$

$$\begin{array}{ccccccc} \epsilon & \hookrightarrow & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \lambda & & 0 & 0 & 0 & 0 & 1 \end{array}$$

10001

λ 1 0 0 0 1 Δ

1

1

1

1

$$\frac{2}{1}$$

Fourth Mode - Heirmologic (Legetos)

$\overset{6}{\gamma} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overset{\Delta}{\delta}$
1 0 0 0 1

010001 $\overset{6}{\gamma} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overset{\Delta}{\delta}$
0 1 0 0 0 1

$\overset{6}{\gamma} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overset{\Delta}{\delta}$
0 1 0 0 0 1

100001 $\overset{6}{\gamma} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overset{\Delta}{\delta}$
1 0 0 0 0 1

0100001 $\overset{6}{\gamma} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overset{\Delta}{\delta}$
0 1 0 0 0 0 1

10X0X01 $\overset{6}{\gamma} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overset{\Delta}{\delta}$
1 0 X 0 X 0 1

From Di

000 $\overset{\Delta}{\delta} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overset{\Delta}{\delta}$
0 0 0

$\overset{\Delta}{\delta} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overset{\Delta}{\delta}$
0 0 0

00000 $\overset{\Delta}{\delta} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overset{\Delta}{\delta}$
0 0 0 0 0

01 $\overset{\Delta}{\delta} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overset{\Delta}{\delta}$
0 1

001 $\overset{\Delta}{\delta} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overset{\Delta}{\delta}$
0 0 1

0001 $\overset{\Delta}{\delta} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overset{\Delta}{\delta}$
0 0 0 1

10X01 $\overset{\Delta}{\delta} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overline{\underbrace{\quad}} \overset{\Delta}{\delta}$
1 0 X 0 1

Fourth Mode - Heirmologic (Legetos)

X0001	$\overset{\Delta}{\mathfrak{A}} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overset{\Delta}{\mathfrak{A}}$ X 0 0 0 1
010001	$\overset{\Delta}{\mathfrak{A}} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overset{\Delta}{\mathfrak{A}}$ 0 1 0 0 0 1
	$\overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright}$ 0 1 1
	$\overset{\Delta}{\mathfrak{A}} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overset{\Delta}{\mathfrak{A}}$ 0 1 0 0 0 1
010001	$\overset{\Delta}{\mathfrak{A}} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overset{\Delta}{\mathfrak{A}}$ 0 1 0 0 0 1
100001	$\overset{\Delta}{\mathfrak{A}} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overset{\Delta}{\mathfrak{A}}$ 1 0 0 0 0 1
0100001	$\overset{\Delta}{\mathfrak{A}} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overset{\Delta}{\mathfrak{A}}$ 0 1 0 0 0 0 1
10X0001	$\overset{\Delta}{\mathfrak{A}} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overset{\Delta}{\mathfrak{A}}$ 1 0 X 0 0 0 1

Accented on second to last syllable:

From Pa

00010	$\overset{\pi}{\mathfrak{q}} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overset{\Delta}{\mathfrak{A}}$ 0 0 0 1 0
	$\overset{\pi}{\mathfrak{q}} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overset{\Delta}{\mathfrak{A}}$ 0 0 0 1 0
000010	$\overset{\pi}{\mathfrak{q}} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overset{\Delta}{\mathfrak{A}}$ 0 0 0 0 1 0

From Vou

10	$\overset{6}{\lambda} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overset{\Delta}{\mathfrak{A}}$ 1 0	$\overbrace{\quad}^{\curvearrowright}$ 1
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Fourth Mode - Heirmologic (Legetos)

010		
0010		
00010		
0X010		
10010		
000010		
010010		

Fourth Mode - Heirmologic (Legetos)

100010

$$\begin{array}{ccccccc} \begin{array}{c} 6 \\ \chi \end{array} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \begin{array}{c} \Delta \\ \mathfrak{A} \end{array} \\ & 1 & & 0 & 0 & 0 & 0 \\ & & & & & & \end{array}$$

1

$$\begin{array}{ccccccc} \epsilon & \cup & \cap & - & - & - & \cup \\ \chi & 1 & 0 & 0 & 0 & 1 & 0 \end{array} \quad \Delta_{\mathfrak{A}}$$
$${}^6\chi_1 \quad 0 \quad 0 \quad 0 \quad 1 \quad \frac{1}{2} \quad 0 \quad \Delta_{\text{eff}}$$

0100010

$$\begin{array}{ccccccc} \overset{6}{\lambda} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \overset{\Delta}{\text{---}} \\ & 0 & 1 & 0 & 0 & 0 & 1 & 0 \end{array}$$

1000010

$$\begin{array}{ccccccc} \overline{\textcircled{6}} & \textcircled{7} & \textcircled{8} & \textcircled{9} & \textcircled{10} & \textcircled{11} & \Delta \\ \lambda & 1 & 0 & 0 & 0 & 0 & 1 & 0 & \tilde{\lambda} \end{array}$$
$$\begin{array}{cccccccc} \epsilon & \overbrace{\quad\quad}^{\Delta} & \overbrace{\quad\quad}^{\Delta} & \overbrace{\quad\quad}^{\Delta} & \overbrace{\quad\quad}^{\Delta} & \overbrace{\quad\quad}^{\Delta} & \overbrace{\quad\quad}^{\Delta} & \overbrace{\quad\quad}^{\Delta} \\ \chi & 1 & 0 & 0 & 0 & 0 & 1 & 0 \end{array}$$

00010010

$$\begin{array}{ccccccccccc} \overset{6}{\lambda} & \curvearrowright & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \overset{\Delta}{\lambda} \\ & 0 & 0 & 0 & 1 & 0 & 0 & 1 & \text{---} & \text{---} & 0 \end{array}$$

From Di

10

$$\begin{array}{c} \Delta \\ \text{A} \\ 1 \end{array} \quad \begin{array}{c} \Delta \\ \text{B} \\ 0 \end{array}$$

0

$$\begin{array}{c} \Delta \\ \text{A} \end{array} \xrightarrow[1]{0} \begin{array}{c} \Delta \\ \text{A} \end{array}$$

0

$$\begin{array}{c} \Delta \\ \text{d} \end{array} \quad \begin{array}{c} \text{---} \\ 1 \end{array} \quad \begin{array}{c} \text{---} \\ 0 \end{array} \quad \begin{array}{c} \Delta \\ \text{d} \end{array}$$
$$\begin{array}{c} \Delta \quad \curvearrowright \quad \Delta \\ \text{♂} \quad 1 \quad 0 \quad \text{♂} \end{array}$$

010

$$\begin{array}{ccccc} \Delta & \text{---} & \cup & \cup & \Delta \\ \text{A} & 0 & 1 & 0 & \text{A} \end{array}$$
$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \text{A} & \text{---} & \text{B} & \text{---} & \text{C} & \text{---} & \text{D} \\ 0 & & 1 & & 0 & & \end{array}$$

Fourth Mode - Heirmologic (Legetos)

00010		
00010		
10010		
000010		
X0X010		
010010		
100010		

Fourth Mode - Heirmologic (Legetos)

0100010		
1000010		
101000010		

Accented on third to last syllable:

From Pa

100	
000100	
100100	
1000100	

From Vou

100	
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Fourth Mode - Heirmologic (Legetos)

	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \\ 1 \quad 0 \quad 0 \end{array} \overset{\Delta}{\mathfrak{A}}$	
	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \\ 1 \quad 0 \quad 0 \end{array} \overset{\Delta}{\mathfrak{A}}$	
	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \\ 1 \quad 0 \quad 0 \end{array} \overset{\Delta}{\mathfrak{A}}$	
	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \\ 1 \quad 0 \quad 0 \end{array} \overset{\Delta}{\mathfrak{A}}$	
101	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \\ 1 \quad 0 \quad 1 \end{array} \overset{\Delta}{\mathfrak{A}}$	
0100	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \\ 0 \quad 1 \quad 0 \quad 0 \end{array} \overset{\Delta}{\mathfrak{A}}$	
	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \\ 0 \quad 1 \quad 0 \quad 0 \end{array} \overset{\Delta}{\mathfrak{A}}$	
10100	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \\ 1 \quad 0 \quad 1 \quad 0 \quad 0 \end{array} \overset{\Delta}{\mathfrak{A}}$	
	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \\ 1 \quad 0 \quad 1 \quad 0 \quad 0 \end{array} \overset{\Delta}{\mathfrak{A}}$	
010100	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \\ 0 \quad 1 \quad 0 \quad 1 \quad 0 \quad 0 \end{array} \overset{\Delta}{\mathfrak{A}}$	
0X0100	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \\ 0 \quad X \quad 0 \quad 1 \quad 0 \quad 0 \end{array} \overset{\Delta}{\mathfrak{A}}$	
01X100	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \\ 0 \quad 1 \quad X \quad 1 \quad 0 \quad 0 \end{array} \overset{\Delta}{\mathfrak{A}}$	
100100	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \\ 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \end{array} \overset{\Delta}{\mathfrak{A}}$	
0100100	$\overset{6}{\lambda} \begin{array}{c} \text{—} \text{—} \text{—} \\ 0 \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \end{array} \overset{\Delta}{\mathfrak{A}}$	$\begin{array}{c} \text{—} \text{—} \text{—} \\ 1 \quad 0 \quad 0 \end{array}$

Fourth Mode - Heirmologic (Legetos)

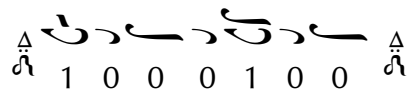
	$\overset{6}{\lambda} \text{ — } \text{↗} \text{ — } \text{—} \text{—} \text{—} \text{↘} \text{↗} \overset{\Delta}{\lambda}$ 0 1 0 0 1 0 0
0100101	$\overset{6}{\lambda} \text{ — } \text{↗} \text{ — } \text{—} \text{↗} \text{↘} \text{—} \text{—} \text{—} \overset{\Delta}{\lambda}$ 0 1 0 0 1 0 1
0000100	$\overset{6}{\lambda} \text{ ↗ — — — — ↗ — — } \overset{\Delta}{\lambda}$ 0 0 0 0 1 0 0
1000100	$\overset{6}{\lambda} \text{ ↘ — — — — ↘ — — } \overset{\Delta}{\lambda}$ 1 0 0 0 1 0 0
000X0100	$\overset{6}{\lambda} \text{ ↗ — — — — ↘ ↗ ↗ } \overset{\Delta}{\lambda}$ 0 0 0 X 0 1 0 0
101000100	$\overset{6}{\lambda} \text{ ↘ ↗ ↗ ↗ — — — ↘ ↗ ↗ } \overset{\Delta}{\lambda}$ 1 0 1 0 0 0 1 0 0

From Di

100	$\overset{\Delta}{\lambda} \text{ ↘ ↗ ↗ } \overset{\Delta}{\lambda}$ 1 0 0
	$\overset{\Delta}{\lambda} \text{ ↗ ↗ — } \overset{\Delta}{\lambda}$ 1 0 0
	$\overset{\Delta}{\lambda} \text{ ↘ ↗ — } \overset{\Delta}{\lambda}$ 1 0 0
	$\overset{\Delta}{\lambda} \text{ ↘ ↗ ↗ } \overset{\Delta}{\lambda}$ 1 0 0
	$\overset{\Delta}{\lambda} \text{ ↘ ↗ ↗ } \overset{\Delta}{\lambda}$ 1 0 0
10X	$\overset{\Delta}{\lambda} \text{ ↗ ↗ — } \overset{\Delta}{\lambda}$ 1 0 X
0100	$\overset{\Delta}{\lambda} \text{ — ↘ ↗ ↗ } \overset{\Delta}{\lambda}$ 0 1 0 0

↘ ↗
1 0

Fourth Mode - Heirmologic (Legetos)



Δ
 Δ

$$\overset{\Delta}{\underset{\text{A}}{\text{A}}} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{\Delta}{\underset{\text{A}}{\text{A}}}$$
$$\begin{array}{cccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \partial & & & & & & & \partial \\ 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \end{array}$$

Accented on fourth to last syllable:

From Vou

$$\begin{array}{ccccccc} \epsilon & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \lambda & 1 & 0 & 0 & 1 & & \delta \end{array}$$
$${}^6_{\chi} \overline{\text{---}}_1 \curvearrowright_0 \curvearrowleft_0 \text{---}_1 \overline{\text{---}}^r_\parallel \Delta_{\mathfrak{A}}$$

1

$$\begin{array}{ccccccc} \epsilon & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \lambda & 1 & 0 & 1 & 0 & \mathfrak{A} \end{array}$$
$${}^6\lambda \quad \begin{array}{cccc} \text{hook} & \text{hook} & \text{hook} & \text{hook} \\ 1 & 0 & 1 & 0 \end{array} \quad \Delta$$
$$\begin{array}{ccccccc}
6 & & & & \Gamma & & \Delta \\
\lambda & & & & \Pi & & \mathfrak{A} \\
1 & 0 & 1 & & & 0 &
\end{array}$$
$$\begin{array}{ccccccccc} \epsilon & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \chi & 0 & 1 & 0 & 0 & 1 & & & \mathfrak{d} \end{array}$$

Fourth Mode - Heirmologic (Legetos)

0X010	$\overset{6}{\lambda} \text{ — — — — } \overset{\Delta}{\lambda}$ 0 X 0 1 0
001010	$\overset{6}{\lambda} \text{ — — — — — — — } \overset{\Delta}{\lambda}$ 0 0 1 0 1 0
101001	$\overset{6}{\lambda} \text{ — — — — — — — } \overset{\Delta}{\lambda}$ 1 0 1 0 0 1

From Di

1000	$\overset{\Delta}{\lambda} \text{ — — — — } \overset{\Delta}{\lambda}$ 1 0 0 0
1001	$\overset{\Delta}{\lambda} \text{ — — — — — — — } \overset{\Delta}{\lambda}$ 1 0 0 1
1010	$\overset{\Delta}{\lambda} \text{ — — — — — — — } \overset{\Delta}{\lambda}$ 1 0 1 0
1100	$\overset{\Delta}{\lambda} \text{ — — — — — — — } \overset{\Delta}{\lambda}$ 1 1 0 0
01000	$\overset{\Delta}{\lambda} \text{ — — — — — — — } \overset{\Delta}{\lambda}$ 0 1 0 0 0
	$\overset{\Delta}{\lambda} \text{ — — — — — — — } \overset{\Delta}{\lambda}$ 0 1 0 0 0
	$\overset{\Delta}{\lambda} \text{ — — — — — — — } \overset{\Delta}{\lambda}$ 0 1 0 0 0
01001	$\overset{\Delta}{\lambda} \text{ — — — — — — — } \overset{\Delta}{\lambda}$ 0 1 0 0 1
	$\overset{\Delta}{\lambda} \text{ — — — — — — — } \overset{\Delta}{\lambda}$ 0 1 0 0 1
	$\overset{\Delta}{\lambda} \text{ — — — — — — — } \overset{\Delta}{\lambda}$ 0 1 0 0 1

—
1

Fourth Mode - Heirmologic (Legetos)

01010

0 1 0 1 0

0 1 0 1 0

0 1 0

0 1 0 1 0

01100

0 1 1 0 0

101010

1 0 1 0 1 0

X0X010

X 0 X 0 1 0

X 0 1 0

0101010

0 1 0 1 0 1 0

1001010

1 0 0 1 0 1 0

100X010

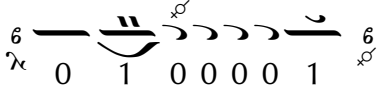
1 0 0 X 0 1 0

D) Formulae with Fthores

Accented on last syllable:

From Vou

10X001 

0100001 

From Di

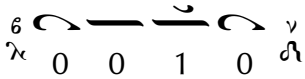
10001 

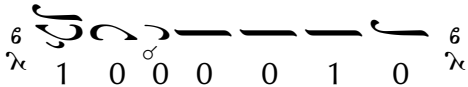
100001 

110001 


Accented on second to last syllable:

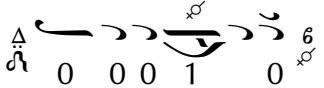
From Vou

0010 

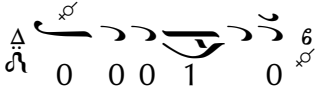
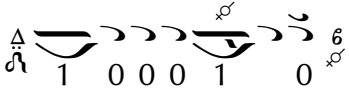
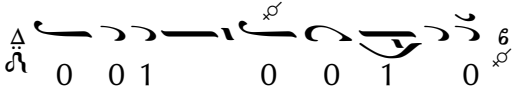
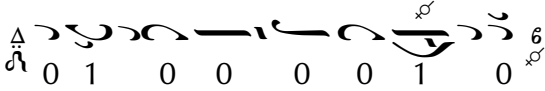
1000010 

From Di

0010 

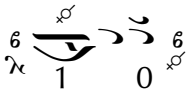
00010 

Fourth Mode - Heirmologic (Legetos)


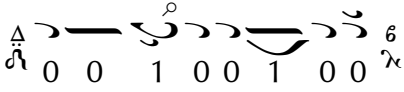
	
100010	
0010010	
01000010	

Accented on third to last syllable:

From Vou


100	
-----	---

From Di

100100	
00100100	

Accented on fourth to last syllable:

From Di

001010	
--------	---

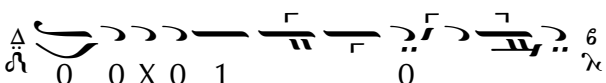
E) Endings for Theotokia*

Accented on last syllable:

(A formula ending in 100 may be used here)

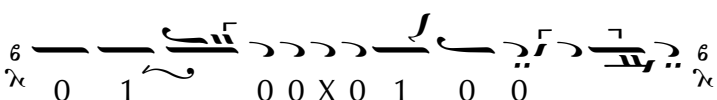
Accented on second to last syllable:

From Di

00X010 

Accented on third to last syllable:

From Vou

0100X0100 

From Di

00100 

100100 

0100100 

1000100 



* The formulae in blue in this section are from the Athonite oral tradition, as represented in the book *Παρακλητική, Μουσικὸν Ἐγκόλπιον, Πλάγιοι Ἦχοι, Ἱεροθέου Ἱερομονάχου*, ἐκδόσεις Ἱ.Μ. Φιλοθέου, Ἁγίου Ὄρους, 2004.

Fourth Mode - Heirmologic (Legetos)

1 0 0 0

0100010X
 $\overset{\Delta}{\underset{\alpha}{\text{d}}}$ 0 1 0 0 0 1 0 X $\overset{6}{\underset{\gamma}{\text{c}}}$

100100100
 $\overset{\Delta}{\underset{\alpha}{\text{d}}}$ 1 0 0 1 0 0 1 0 0 $\overset{6}{\underset{\gamma}{\text{c}}}$

Accented on fourth to last syllable:

From Di

1001
 $\overset{\Delta}{\underset{\alpha}{\text{d}}}$ 1 0 0 1 $\overset{\sigma}{\text{c}}$ $\overset{6}{\underset{\gamma}{\text{c}}}$

BYZANTINE MUSIC FORMULAE

Fourth Mode - Heirmologic (Soft Chromatic)

Contents*

A) Cadences on Vou.....	369
B) Cadences on Di.....	372
C 1) Cadences on Zo.....	381
2) Formulae from Zo.....	382
D) Endings for Theotokia	383

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

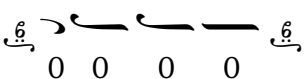
Variations of the same formula
are indicated in color

* The Byzantine music formulae herein were extracted from all the heirmologic melodies found in the *Zoe Anastasimatarion* (14th edition, 2002), some melodies of Vol. I of the *Doxastarion* by Petros Peloponnesios (and Keltzanides), and all the heirmologic melodies in Vol. I of *Mousike Kypsele*.

A) Cadences on Vou

Accented on last syllable:

From Vou

0000 

From Di

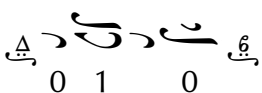
001 

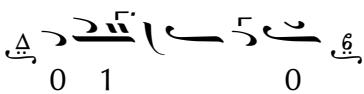
10001 

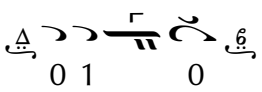
Accented on second to last syllable:

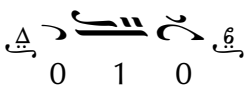
From Di

010 



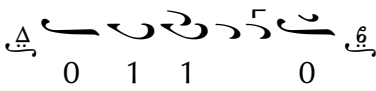
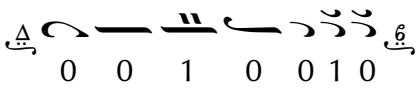
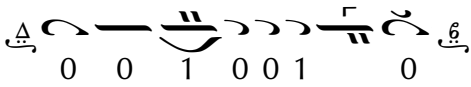







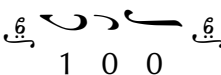
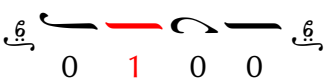
0010 

Fourth Mode - Heirmologic (Soft Chromatic)

0110	
0010010	
	

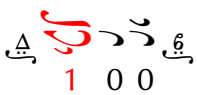

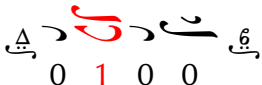

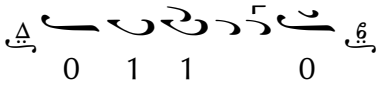
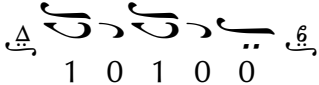
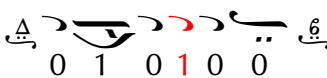

Accented on third to last syllable:

From Vou

100	
	
0100	


1

From Di

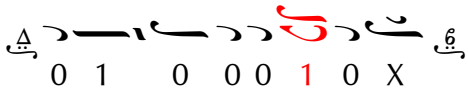
100		 1
0100		 1
0110		
10100		
010100		 1

Fourth Mode - Heirmologic (Soft Chromatic)


100100


010010X




010010X




10010100



10100100


100100100

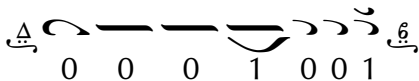

Accented on fourth to last syllable:

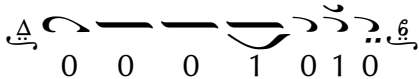
From Di

1001


01001




0001001


0001010


1001001


B) Cadences on Di

Accented on last syllable:

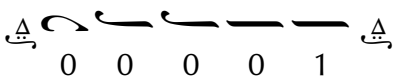
From Vou

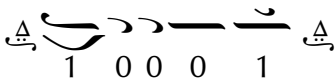
01	
001	
0001	
00001	
10001	
01010001	

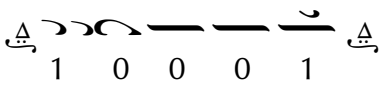
From Di

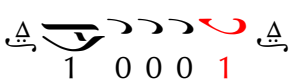
00	
00000	
01	
001	
0001	

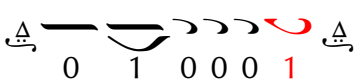
Fourth Mode - Heirmologic (Soft Chromatic)

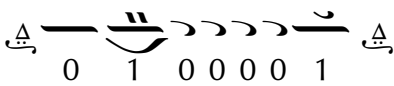
00001 

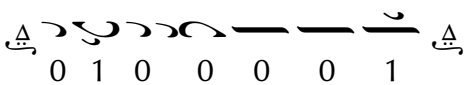
10001 





010001 

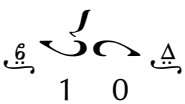
0100001 

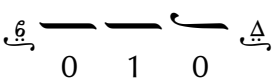


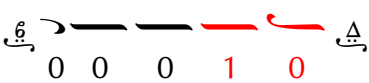
Accented on second to last syllable:

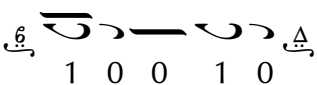
From Vou

10 



010 

00010 

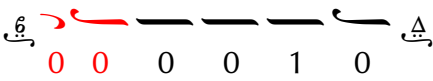
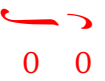
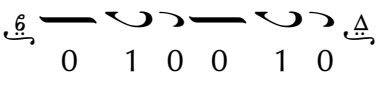
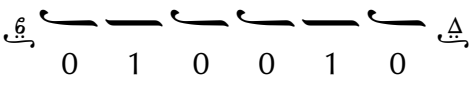
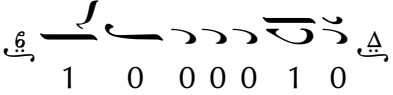
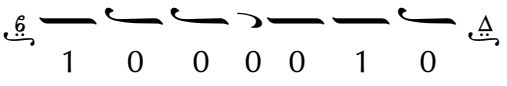
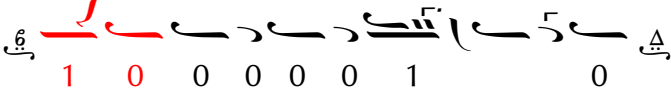

10010 




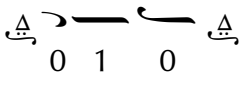
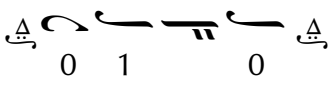
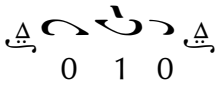
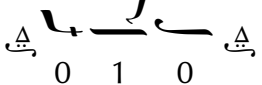
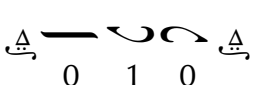
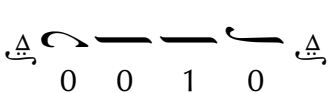




Fourth Mode - Heirmologic (Soft Chromatic)

000010		
010010		
		
1000010		
		
10000010		

From Di

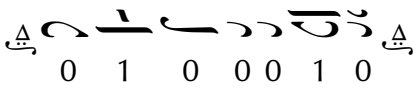
10	
010	
	
	
	
	
0010	

Fourth Mode - Heirmologic (Soft Chromatic)

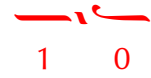
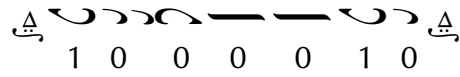
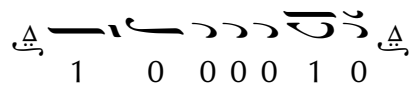
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10010		
000010		
010010		
100010		
0010010		

Fourth Mode - Heirmologic (Soft Chromatic)

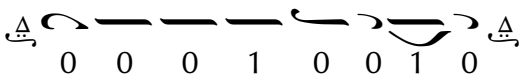
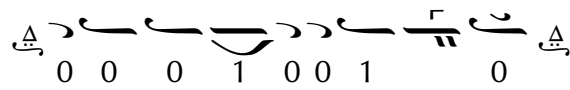
0100010



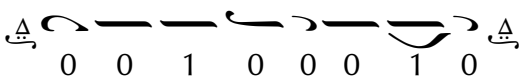
1000010

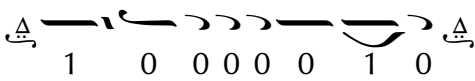
00010010

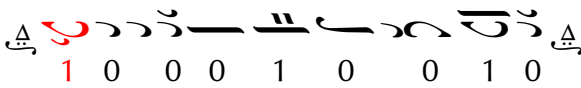
00100010



10000010



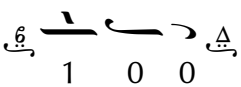
100010010





Accented on third to last syllable:

From Vou

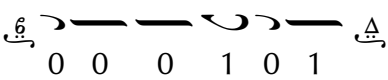
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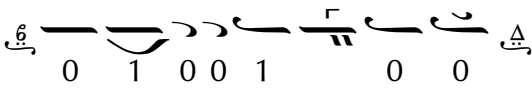
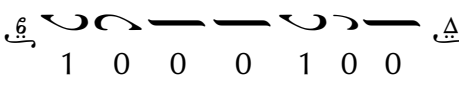
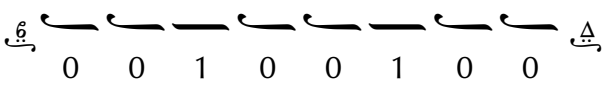
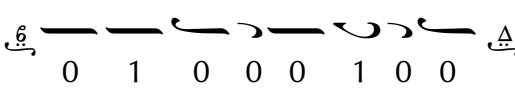
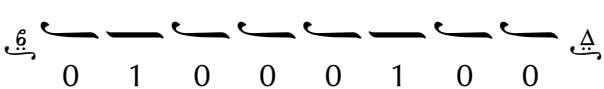
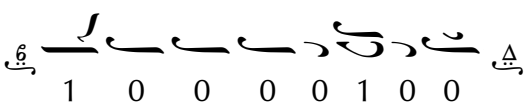
0100



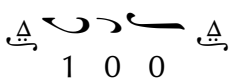
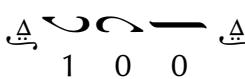
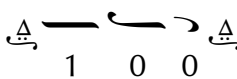

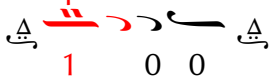
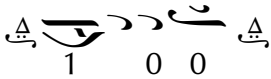
000100



Fourth Mode - Heirmologic (Soft Chromatic)

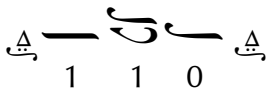
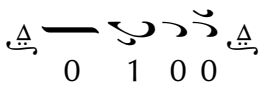

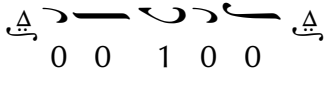
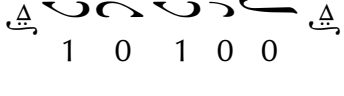
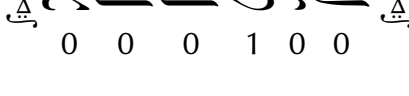
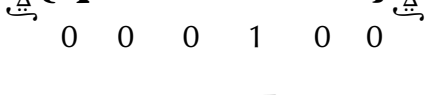
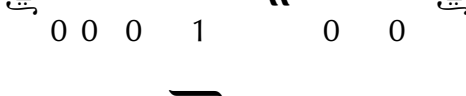
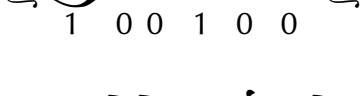
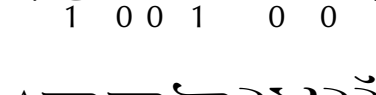
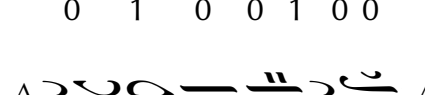
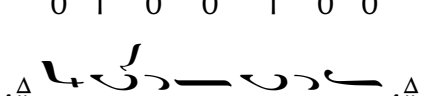
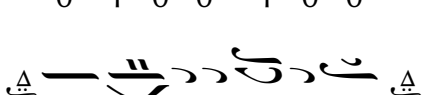

100100	
0100100	
1000100	
00100100	
01000100	
	
10000100	

From Di

100	
	
	
	
	
	



Fourth Mode - Heirmologic (Soft Chromatic)

110	
0100	
	
00100	
10100	
000100	
	
000100	
100100	
	
0100100	
	
	
	

Fourth Mode - Heirmologic (Soft Chromatic)

1000100

00100100

01010100

010000100

100100100

1

Accented on fourth to last syllable:

From Vou

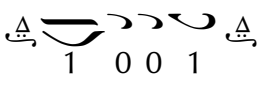
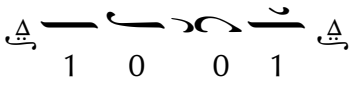
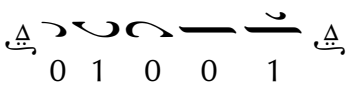
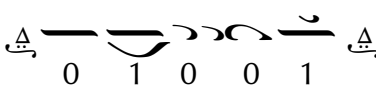
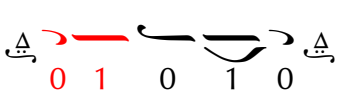
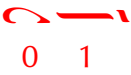
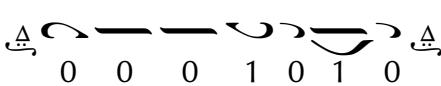
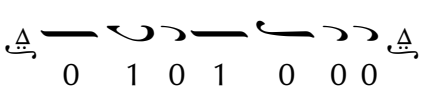

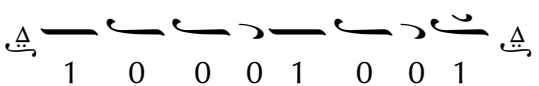
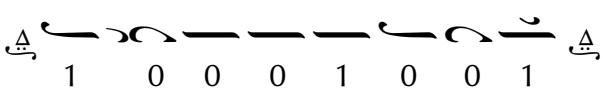
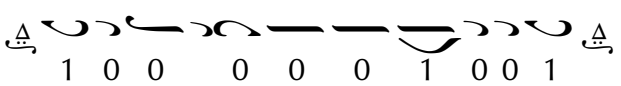
1001

0101010

10001001

Fourth Mode - Heirmologic (Soft Chromatic)

From Di

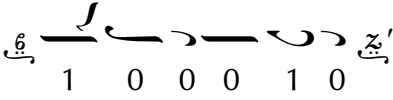
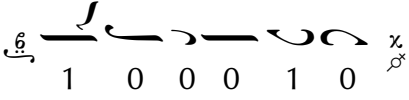
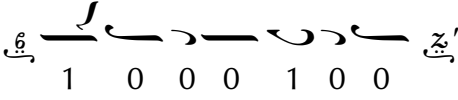
1001		
		
01001		
		
01010		
0001010		
0101000		
1001001		
10001001		
10001001		
1000001001		

Fourth Mode - Heirmologic (Soft Chromatic)

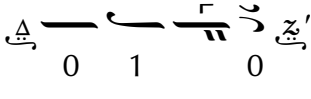
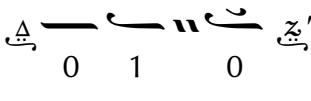
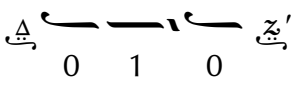
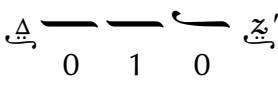
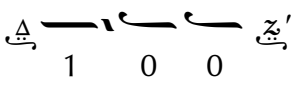
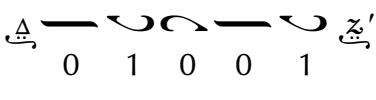
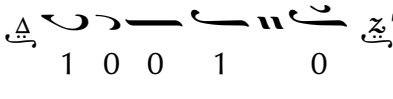
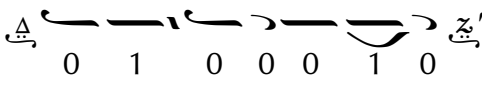
C1) Cadences on Zo

Cadences on Zo are extremely rare in this mode. However, they are common just before the final cadence in Theotokia, in which case they may have a cadence on Zo with a klasma.

From Vou

100010	
100010	
1000100	

From Di

010	
	
	
	
100	
01001	
10010	
0100010	

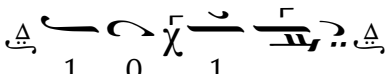
C2) Formulae from Zo

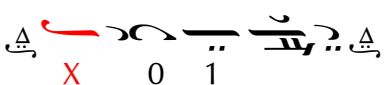
From Vou


010	$\begin{array}{c} \text{ζ}' \text{ } \text{ζ}' \\ \text{0} \text{ } \text{1} \text{ } \text{0} \end{array}$
0010	$\begin{array}{c} \text{ζ}' \text{ } \text{ζ}' \\ \text{0} \text{ } \text{0} \text{ } \text{1} \text{ } \text{0} \end{array}$
0100	$\begin{array}{c} \text{ζ}' \text{ } \text{ζ}' \\ \text{0} \text{ } \text{1} \text{ } \text{0} \text{ } \text{0} \end{array} \text{Δ}$
010010	$\begin{array}{c} \text{ζ}' \text{ } \text{ζ}' \\ \text{0} \text{ } \text{1} \text{ } \text{0} \text{ } \text{0} \text{ } \text{1} \text{ } \text{0} \end{array} \text{Δ}$
0100100	$\begin{array}{c} \text{ζ}' \text{ } \text{ζ}' \\ \text{0} \text{ } \text{1} \text{ } \text{0} \text{ } \text{0} \text{ } \text{1} \text{ } \text{0} \text{ } \text{0} \end{array} \text{Δ}$
01001001	$\begin{array}{c} \text{ζ}' \text{ } \text{ζ}' \\ \text{0} \text{ } \text{1} \text{ } \text{0} \text{ } \text{0} \text{ } \text{1} \text{ } \text{0} \text{ } \text{0} \text{ } \text{1} \end{array} \text{Δ}$
10000010	$\begin{array}{c} \text{ζ}' \text{ } \text{ζ}' \\ \text{1} \text{ } \text{0} \text{ } \text{0} \text{ } \text{0} \text{ } \text{0} \text{ } \text{0} \text{ } \text{1} \text{ } \text{0} \end{array} \text{Δ}$


D) Endings for Theotokia

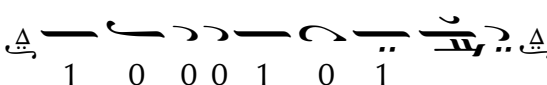
Accented on last syllable:

101 

X01 

010001 


100001 

1000101 



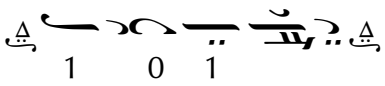


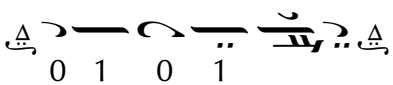
Accented on second to last syllable:

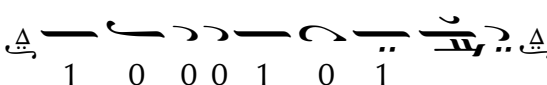
010 

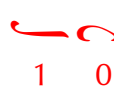
Accented on third to last syllable:

100 

101 

0101 

1000101 





Plagal First Mode



BYZANTINE MUSIC FORMULAE

Plagal First Mode - Sticheraric

Contents*

Medial Formulae from Pa

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C) Pa - Ke	392
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Medial Formulae from Di

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* The Byzantine music formulae herein were extracted from sticheraric melodies found in the *Zoe Anastasi-matarion* (14th edition, 2002) Volume I of *Mousike Kypsele* (1883 edition), and the two-volume *Athonias* (1906 edition) by Petros Philanthidis.

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

A) Medial Formulae Pa - Pa

Some of these formulae may be used as initial formulae. There are not many formulae in this section, because melodic phrases in this mode infrequently begin and end on Pa.

Accented on last syllable:

10001

0010001

0010001

010X001

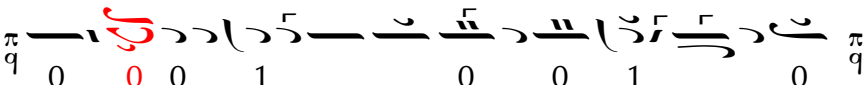

Accented on second to last syllable:

10

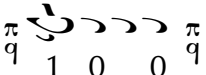
10010

010010

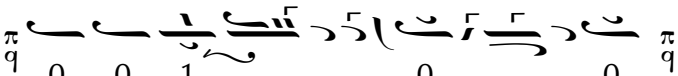
Plagal First Mode - Sticheraric

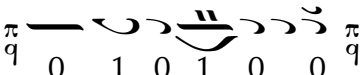
00010010 π_q  π_q 

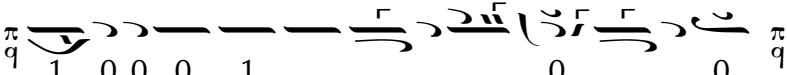
Accented on third to last syllable:

100 π_q  π_q

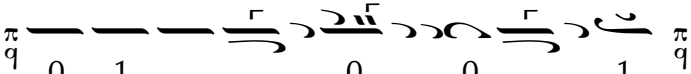
0100 π_q  π_q 

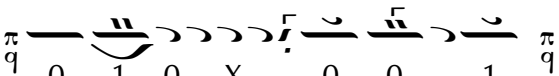
00100 π_q  π_q

010100 π_q  π_q

1000100 π_q  π_q

Accented on fourth to last syllable:

01001 π_q  π_q

010X001 π_q  π_q

B) Medial Formulae Pa - Di

This section is also almost empty, due to the infrequency of such melodic patterns in this mode.

Accented on last syllable:

$$0001 \quad \begin{array}{c} \pi \\ q \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 1 \end{array} \begin{array}{c} \Delta \\ \text{—} \\ \text{—} \end{array}$$

Accented on second to last syllable:

$$00 \quad \begin{array}{c} \pi \\ q \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \Delta \\ \text{—} \\ \text{—} \end{array}$$

$$10 \quad \begin{array}{c} \pi \\ q \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \Delta \\ \text{—} \\ \text{—} \end{array}$$

$$10 \quad \begin{array}{c} \pi \\ q \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \Delta \\ \text{—} \\ \text{—} \end{array}$$

$$010 \quad \begin{array}{c} \pi \\ q \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \Delta \\ \text{—} \\ \text{—} \end{array}$$

$$0010 \quad \begin{array}{c} \pi \\ q \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \Delta \\ \text{—} \\ \text{—} \end{array}$$

$$100010 \quad \begin{array}{c} \pi \\ q \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \Delta \\ \text{—} \\ \text{—} \end{array}$$


$$0100010 \quad \begin{array}{c} \pi \\ q \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \Delta \\ \text{—} \\ \text{—} \end{array}$$


Accented on third to last syllable:

$$100 \quad \begin{array}{c} \pi \\ q \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \Delta \\ \text{—} \\ \text{—} \end{array}$$

$$\begin{array}{c} \pi \\ q \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{—} \\ 0 \end{array} \begin{array}{c} \Delta \\ \text{—} \\ \text{—} \end{array}$$

Plagal First Mode - Sticheric

000100 π_q 

0100100 π_q  Δ

Accented on fourth to last syllable:

001001 π_q $\frac{\text{---}}{0}$ $\frac{\text{---}}{0}$ $\frac{\text{---}}{1}$ $\frac{\text{---}}{\text{---}}$ $\frac{\text{---}}{0}$ $\frac{\text{---}}{0}$ $\frac{\text{---}}{1}$ $\frac{\Delta}{\mathfrak{A}}$

$$\pi_q \begin{array}{cccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 0 & 1 & 0 & 0 & 1 \end{array} \Delta_{\mathfrak{A}}$$

C) Medial Formulae Pa - Ke

See also sections C1 and C2 for alternate ways the melody can move from Pa to Ke.

Formulae in section J may also be used by adding four to the interval of the first character.

Accented on last syllable:

$$0 \quad \pi_q \quad \frac{\pi}{0} \quad \frac{x}{q}$$
$$01 \quad \pi_q \quad \begin{array}{c} \text{---} \\ 0 \end{array} \quad \begin{array}{c} \text{---} \\ 1 \end{array} \quad \bar{\pi}_q$$
$$001 \quad \pi_q \begin{array}{ccc} \text{---} & \text{---} & \text{=} \\ 0 & 0 & 1 \end{array} x_q$$

10001 π_q $\frac{1}{1}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{5}{0}$ $\frac{1}{1}$ $\frac{1}{1}$ $\frac{1}{1}$ $\frac{1}{1}$

10001

π_q $\frac{1}{1}$ $\frac{5}{0}$ $\frac{5}{0}$ $\frac{5}{0}$ $\frac{5}{1}$ $\frac{5}{q}$

0

10X01 $\pi_q \frac{1}{1} \frac{1}{0} \frac{1}{X} \frac{1}{0} \frac{1}{1} \frac{1}{q}$

010001 π_q $\underbrace{\quad\quad}_0$ $\underbrace{\quad\quad}_1$ $\underbrace{\quad\quad}_0$ $\underbrace{\quad\quad}_0$ $\underbrace{\quad\quad}_0$ $\underbrace{\quad\quad}_1$ π_q

0001001

π_q 0 0 0 1 0 0 0 1 $\frac{5}{q}$

$$\pi_q \begin{array}{ccccccc} \text{---} & \text{---} & \text{=} & \text{)} & \text{)} & \text{=} & \text{)} \\ 0 & 0 & 1 & 0 & 0 & 0 & 1 \end{array} \chi_{\bar{q}}$$

Accented on second to last syllable:

10 $\pi_q \begin{array}{c} \text{1} \\ \text{0} \end{array} \begin{array}{c} \text{1} \\ \text{0} \end{array} \begin{array}{c} \text{1} \\ \text{0} \end{array}$

$$\pi_q \frac{1}{1} \approx \frac{1}{0} \approx x_q$$

1

Plagal First Mode - Sticheric

[illegible]

Plagal First Mode - Sticheraric

100010	π η 1 0 0 0 1 0 $\frac{x}{q}$
0100010	π η 0 1 0 0 0 1 0 $\frac{x}{q}$
000100010	π η 0 0 0 1 0 0 0 1 0 $\frac{x}{q}$

Accented on third to last syllable:

100	π η 1 0 0 $\frac{x}{q}$	$\frac{x}{q}$ 0 0
	π η 1 0 0 $\frac{x}{q}$	
X10	π η X 1 0 $\frac{x}{q}$	
0100	π η 0 1 0 0 $\frac{x}{q}$	
	π η 0 1 0 0 $\frac{x}{q}$	$\frac{x}{q}$ 0
X100	π η X 1 0 0 $\frac{x}{q}$	
00100	π η 0 0 1 0 0 $\frac{x}{q}$	
	π η 0 0 1 0 0 $\frac{x}{q}$	$\frac{x}{q}$ 0
	π η 0 0 1 0 0 0 $\frac{x}{q}$	
10100	π η 1 0 1 0 0	

Plagal First Mode - Sticheraric

010100

π_q \tilde{q}

0 1 0 1 0 0

0100100

π_q \tilde{q}

1 0 0 0 1 0 0

00100100

π_q \tilde{q}

0 0 1 0 0 1 0 0

01000100

π_q \tilde{q}

0 1 0 0 0 1 0 0

010100100

π_q \tilde{q}

0 1 0 1 0 0 1 0 0

000100100

π_q \tilde{q}

0 0 0 1 0 0 1 0 0

Accented on fourth to last syllable:

1001

π_q \tilde{q}

1 0 0 1

1010

π_q \tilde{q}

1 0 1 0

Plagal First Mode - Sticheraric

	π_q		$\frac{x}{q}$
X100	π_q		$\frac{x}{q}$
01001	π_q		$\frac{x}{q}$
	π_q		$\frac{x}{q}$
	π_q		$\frac{x}{q}$
001001	π_q		$\frac{x}{q}$
1001001	π_q		$\frac{x}{q}$
010001001	π_q		$\frac{x}{q}$

C1) Medial Formulae Pa - Vou

These melodies must be followed by a formula in the following section (ending on Ke)

Two syllables:

00 $\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

10 $\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

Three syllables:

000 $\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$ $\begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

010 $\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

100 $\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$ $\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

Four syllables:

0000 $\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

0100 $\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

0010 $\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

Five syllables:

01000 $\pi \begin{array}{c} \text{—} \\ \text{q} \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ \text{6} \\ \text{λ} \end{array}$

C2) Medial Formulae Vou - Ke

These melodies must be preceded by a formula in the previous section (ending on Vou)

Accented on last syllable:

01 $\frac{6}{\lambda} \xrightarrow{0} \frac{2}{1} \xrightarrow{1} \frac{2}{q}$

Accented on second to last syllable:

010

Diagram illustrating the sequence of operations for the value 010, showing the progression of the number 6 through various states (λ, 0, 1, 0) and the resulting sequence of operations (1, 5, 0).

$$\begin{array}{ccccccc} & 6 & & & & & \\ & \text{---} & \text{u} & \text{---} & \text{u} & \text{---} & \\ \lambda & 0 & & 1 & & 0 & \ddot{q} \end{array}$$

X010 $\overset{6}{\gamma} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{2}{q}$
 $\chi \quad 0 \quad 1 \quad 0$

Accented on third to last syllable:

0100

Diagram illustrating the 0100 state. The top line shows a sequence of segments: a black segment labeled 6 above and λ below, followed by a red segment labeled 5 above and q below. The bottom line shows a sequence of segments: a black segment labeled 0 below, followed by a red segment labeled 1 below, followed by a black segment labeled 0 below. Double arrows indicate connections between the segments: a black double arrow between the first black segments, a red double arrow between the red segments, and a black double arrow between the last black segments.

$$\begin{array}{ccccccc} \epsilon & & & 5 & & 5 & & 2 \\ \lambda & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ & 0 & & 1 & & 0 & & 0 \end{array} \quad \begin{array}{c} x \\ q \end{array}$$
$$\begin{array}{ccccccc} \epsilon & & & & & & \\ \lambda & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & x \\ & 0 & 1 & 0 & & 0 & q \end{array}$$

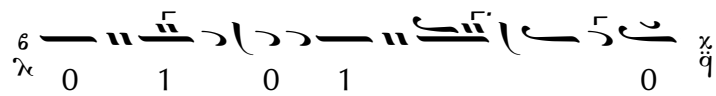
0101 $\begin{matrix} \text{6} \\ \gamma \\ \text{0} \end{matrix} \text{---} \text{''} \begin{matrix} \text{5} \\ \text{1} \end{matrix} \text{---} \text{)} \text{)} \begin{matrix} \text{5} \\ \text{0} \end{matrix} \text{---} \begin{matrix} \text{2} \\ \text{1} \end{matrix} \begin{matrix} \text{8} \\ \text{q} \end{matrix}$

Accented on fourth to last syllable:

X010 $\overset{6}{\chi} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{2}{q}$
 $\chi \quad 0 \quad 1 \quad 0$

Plagal First Mode - Sticheraric

01010



D) Medial Formulae Pa - High Nee

These must be followed by a formula in section L1 or L2.

Accented on last syllable:

(Use a formula below ending in 100 or 1001)

Accented on second to last syllable:

10010	π_q 1 0 0 1 0 η'	 0
-------	--------------------------------------	-------

1010010	π_q 1 0 1 0 0 1 0 η'	
---------	--	--

Accented on third to last syllable:

0100	π_q 0 1 0 0 η'	 0
------	----------------------------------	-------

00100	π_q 0 0 1 0 0 η'	 0
-------	--------------------------------------	-------

00000101	π_q 0 0 0 0 0 1 0 1 η'	
----------	--	--

Accented on fourth to last syllable:

1001	π_q 1 0 0 1 η'	
------	----------------------------------	--

0001010	π_q 0 0 0 1 0 1 0 η'	
---------	--	--

1001010	π_q 1 0 0 1 0 1 0 η'	 0
---------	--	-------

E) Medial Formulae Di - Pa

Accented on last syllable:

00X0X

0 0 X 0 0 X

00X0X

0 0 X 0 0 X

10X0X

1 0 X 0 0 X

010X0X

0 1 0 X 0 X

0010X0X

0 0 1 0 X 0 X

1010X0X

1 0 1 0 X 0 X

Accented on second to last syllable:

0010	$\overset{\Delta}{\mathfrak{A}}$
	$\overset{\Delta}{\mathfrak{A}}$
	$\overset{\Delta}{\mathfrak{A}}$
00010	$\overset{\Delta}{\mathfrak{A}}$
100010	$\overset{\Delta}{\mathfrak{A}}$
010010	$\overset{\Delta}{\mathfrak{A}}$
0X0X010	$\overset{\Delta}{\mathfrak{A}}$
1X0X010	$\overset{\Delta}{\mathfrak{A}}$
00010010	$\overset{\Delta}{\mathfrak{A}}$

Plagal First Mode - Sticheraric

Diagram illustrating the Plagal First Mode - Sticheraric notation for various binary sequences. The notation uses stylized musical symbols (neumes) and binary digits (0, 1, X) to represent the mode.

00100010

0 0 1 0 0 0 1 0

00X0X010

0 0 X 0 X 0 1 0

01X0X010

0 1 X 0 X 0 1 0

010X0X010

0 1 0 X 0 X 0 1 0

Accented on third to last syllable:

Diagram illustrating the Plagal First Mode - Sticheraric notation for various binary sequences, accented on the third to last syllable.

0100

0 1 0 0

00100

0 0 1 0 0

00100

0 0 1 0 0

Plagal First Mode - Sticheraric

	Δ δ π q	
01100	Δ δ π q	
10100	Δ δ π q	
00X0X	Δ δ π q	
00X0X	Δ δ π q	
000100	Δ δ π q	
X00100	Δ δ π q	
010010X	Δ δ π q	
0010100	Δ δ π q	

Plagal First Mode - Sticheric

010010X

$\overset{\Delta}{\underset{d}{\curvearrowright}}$
 $\overset{\sim}{\curvearrowright}$
 \mathfrak{G}
 \neg
 \neg
 $\textcolor{red}{\neg}$
 \neg
 \mathfrak{G}
 \neg
 \mathfrak{G}
 \neg
 $\overset{\pi}{\underset{q}{\curvearrowright}}$

0 1 0 0 1 0 X

— ۱۲ —

0010X0X

πq



1010X0X Δ 1 0 1 0 X 0 X π

1010010X

ת

Δ

01000100

$\frac{\pi}{q}$

0 1 0 0 0 1 0

0 0

0010010X

$\frac{A}{a}$ 0 0 1 0 0 1 0 X πq

$\Delta_{\vec{A}}$

10000100

1 0 0 0 0 1 0 0

π_9

Plagal First Mode - Sticheraric

X0001100100

X 0 0 0 1 1 0 0 1 0 X

Accented on fourth to last syllable:

1001

1 0 0 1

10XX

1 0 X X

1 0 0 1

01001

0 1 0 0 1

10001

1 0 0 0 1

01010

0 1 0 1 0

001001

0 0 1 0 0 1

0 0 1 0 0 1

0 0

1 0

0 0 0 0

001010

0 0 1 0 1 0

Plagal First Mode - Sticheraric

101010

1 0 1 0 1 0

0001001

0 0 0 1 0 0 1

1001001

1 0 0 1 0 0 1

X001001

X 0 0 1 0 0 1

0X01010

0 X 0 1 0 1 0

0X0X010

0 X 0 1 0

1X0X010

1 X 0 X 0 1 0

01X01010

0 1 X 0 1 0 1 0

Plagal First Mode - Sticheraric

01001001

Δ

Δ

01001001

Δ

10X01010

Δ

Δ

00X0X010

Δ

Δ

01X0X010

Δ

Δ

010001001

Δ

Δ

Plagal First Mode - Sticheraric

101001001

Δ π η

1 0 1 0 0 1 0 0 1 0 0 1

001001001

Δ π η

0 0 1 0 0 1 0 0 1 0 0 1

010X0X010

Δ π η

0 1 0 X 0 X 0 1 0

F) Medial Formulae Di - Di

Accented on last syllable:

Index	Input	Output
00	$\Delta \rightarrow 0 \rightarrow \Delta$	$\Delta \rightarrow 0 \rightarrow \Delta$
001	$\Delta \rightarrow 0 \rightarrow 0 \rightarrow 1 \rightarrow \Delta$	$\Delta \rightarrow 0 \rightarrow 1 \rightarrow \Delta$
0X01	$\Delta \rightarrow 0 \rightarrow 0 \rightarrow 1 \rightarrow \Delta$	$\Delta \rightarrow 1 \rightarrow \Delta$
0001	$\Delta \rightarrow 0 \rightarrow 0 \rightarrow 0 \rightarrow 1 \rightarrow \Delta$	$\Delta \rightarrow 0 \rightarrow 1 \rightarrow \Delta$
X0001	$\Delta \rightarrow 0 \rightarrow 0 \rightarrow 0 \rightarrow 1 \rightarrow \Delta$	$\Delta \rightarrow X \rightarrow \Delta$
10001	$\Delta \rightarrow 1 \rightarrow 0 \rightarrow 0 \rightarrow 0 \rightarrow 1 \rightarrow \Delta$	$\Delta \rightarrow 1 \rightarrow \Delta$
10X0X	$\Delta \rightarrow 1 \rightarrow 0 \rightarrow X \rightarrow 0 \rightarrow X \rightarrow \Delta$	$\Delta \rightarrow 1 \rightarrow \Delta$
010001	$\Delta \rightarrow 0 \rightarrow 1 \rightarrow 0 \rightarrow 0 \rightarrow 0 \rightarrow 1 \rightarrow \Delta$	$\Delta \rightarrow 0 \rightarrow 1 \rightarrow \Delta$
0010001	$\Delta \rightarrow 0 \rightarrow 0 \rightarrow 1 \rightarrow 0 \rightarrow 0 \rightarrow 0 \rightarrow 1 \rightarrow \Delta$	$\Delta \rightarrow 0 \rightarrow 1 \rightarrow \Delta$
01000X01	$\Delta \rightarrow 0 \rightarrow 1 \rightarrow 0 \rightarrow 0 \rightarrow 0 \rightarrow X \rightarrow 0 \rightarrow 1 \rightarrow \Delta$	$\Delta \rightarrow 0 \rightarrow 1 \rightarrow \Delta$
000100100	$\Delta \rightarrow 0 \rightarrow 0 \rightarrow 0 \rightarrow 1 \rightarrow 0 \rightarrow 0 \rightarrow 1 \rightarrow 0 \rightarrow 0 \rightarrow \Delta$	$\Delta \rightarrow 0 \rightarrow 1 \rightarrow \Delta$

Plagal First Mode - Stichleraric

00110010001 Δ 0 0 1 1 0 0 1 0 0 0 1 Δ

Accented on second to last syllable:

10		
010		
0010		

Plagal First Mode - Sticheraric

00010	 $\overset{\Delta}{\text{A}} \sim \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\text{A}}$ $\underset{\Delta}{\text{A}} \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad \underset{\Delta}{\text{A}}$	 $\text{—} \text{—} \text{—} \text{—} \text{—} \text{—}$ $\underset{\Delta}{\text{A}} \quad 1 \quad 0$
10010	 $\overset{\Delta}{\text{A}} \sim \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\text{A}}$ $\underset{\Delta}{\text{A}} \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad \underset{\Delta}{\text{A}}$	 $\text{—} \text{—} \text{—} \text{—} \text{—} \text{—}$ $\underset{\Delta}{\text{A}} \quad 1 \quad 0$
010010	 $\overset{\Delta}{\text{A}} \sim \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\text{A}}$ $\underset{\Delta}{\text{A}} \quad 0 \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad \underset{\Delta}{\text{A}}$	
100010	 $\overset{\Delta}{\text{A}} \sim \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\text{A}}$ $\underset{\Delta}{\text{A}} \quad 1 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad \underset{\Delta}{\text{A}}$	
00010010	 $\overset{\Delta}{\text{A}} \sim \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\text{A}}$ $\underset{\Delta}{\text{A}} \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad \underset{\Delta}{\text{A}}$	
010100010	 $\overset{\Delta}{\text{A}} \sim \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\text{A}}$ $\underset{\Delta}{\text{A}} \quad 0 \quad 1 \quad 0 \quad 1 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad \underset{\Delta}{\text{A}}$	
0001000010	 $\overset{\Delta}{\text{A}} \sim \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\text{A}}$ $\underset{\Delta}{\text{A}} \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad \underset{\Delta}{\text{A}}$	
0100001000010010	 $\overset{\Delta}{\text{A}} \sim \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\text{A}}$ $\underset{\Delta}{\text{A}} \quad 0 \quad 1 \quad 0 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad \underset{\Delta}{\text{A}}$	

Accented on third to last syllable:

Plagal First Mode - Sticheric

10X

100

$$\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}} \quad \begin{array}{c} \text{---} \\ \text{---} \\ \text{---} \end{array} \quad \begin{array}{c} \text{---} \\ \text{---} \\ \text{---} \end{array} \quad \begin{array}{c} \text{---} \\ \text{---} \\ \text{---} \end{array} \quad \overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$$
$$\begin{array}{ccccc} \Delta & & & & \Delta \\ \text{A} & & & & \text{A} \\ \text{1} & & 0 & & 0 \end{array}$$

0100

$$\begin{array}{ccccccc} \Delta & \overline{\overline{1}} & \overline{\overline{2}} & \overline{1} & \overline{1} & \overline{1} & \overline{1} \\ \mathfrak{A} & 0 & 1 & 0 & 0 & & \mathfrak{A} \end{array}$$

Δ
 δ 0 1 0 0 δ
 Δ

Δ
 \mathfrak{A}

$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \mathfrak{A} & 0 & 1 & 0 & 1 & 0 & \mathfrak{A} \end{array}$$
$$\begin{array}{ccccccc} \Delta & & & \Gamma & & \Gamma & \Delta \\ \text{A} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{A} \\ 0 & 1 & & 0 & 0 & & \end{array}$$

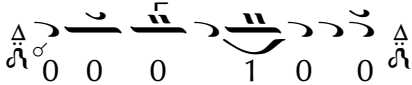
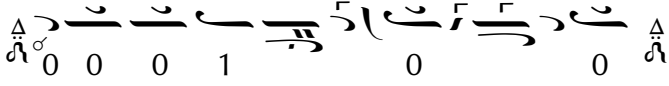
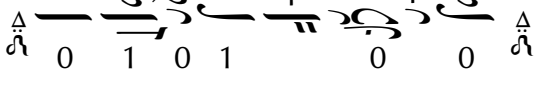
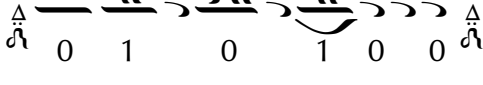
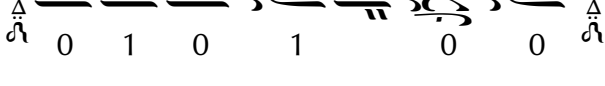
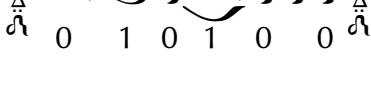
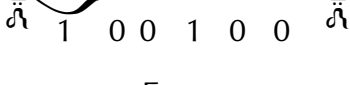
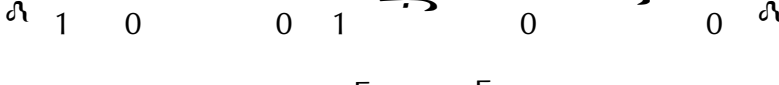
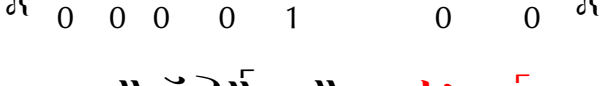
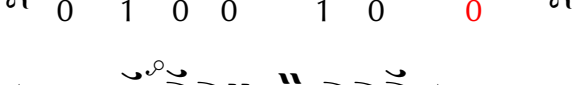

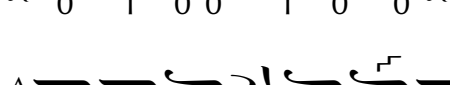
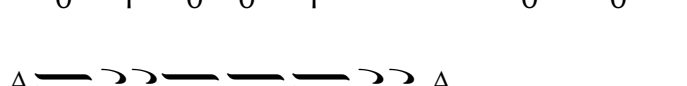
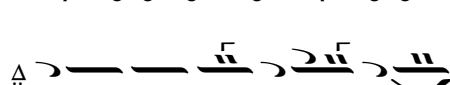

0X01

00100

10X0X

000100

Plagal First Mode - Sticheraric

		
		
010100		
		
		
		
100100		
		
0000100		
0100100		
		
		
1000100		
00010100		

Plagal First Mode - Sticheraric

010010100 $\overset{\Delta}{\text{A}}$ — $\overset{\Delta}{\text{A}}$ 0 1 0 0 1 0 1 $\overset{\Delta}{\text{A}}$ 5 0 $\overset{\Delta}{\text{A}}$ 0 $\overset{\Delta}{\text{A}}$

Accented on fourth to last syllable:

1001 $\overset{\Delta}{\text{A}}$ $\overset{\Delta}{\text{A}}$ 1 0 0 1 $\overset{\Delta}{\text{A}}$ $\overset{\Delta}{\text{A}}$ 1

$\overset{\Delta}{\text{A}}$ — $\overset{\Delta}{\text{A}}$ 1 0 0 1 $\overset{\Delta}{\text{A}}$

1010 $\overset{\Delta}{\text{A}}$ 1 0 1 0 $\overset{\Delta}{\text{A}}$

$\overset{\Delta}{\text{A}}$ 1 0 1 0 $\overset{\Delta}{\text{A}}$

01001 $\overset{\Delta}{\text{A}}$ 0 1 0 0 1 $\overset{\Delta}{\text{A}}$

01010 $\overset{\Delta}{\text{A}}$ 0 1 0 1 0 $\overset{\Delta}{\text{A}}$

$\overset{\Delta}{\text{A}}$ 0 1 0 1 0 $\overset{\Delta}{\text{A}}$

001001 $\overset{\Delta}{\text{A}}$ 0 0 1 0 0 1 $\overset{\Delta}{\text{A}}$

001010 $\overset{\Delta}{\text{A}}$ 0 0 1 0 1 0 $\overset{\Delta}{\text{A}}$

$\overset{\Delta}{\text{A}}$ 0 0 1 0 1 0 $\overset{\Delta}{\text{A}}$

0001010 $\overset{\Delta}{\text{A}}$ 0 0 0 1 0 1 0 $\overset{\Delta}{\text{A}}$

G) Medial Formulae Di - Ke

This section is small, because melodies in this mode rarely move from Di to Ke.

Accented on last syllable:

$$\frac{\Delta}{\mathfrak{A}} \frac{\mathfrak{A}}{0} \frac{\mathfrak{A}}{0}$$

010001

Accented on second to last syllable:

010

$\begin{array}{c} \Delta \\ \text{A} \end{array}$ — \hookrightarrow \times

0 1 0 q

$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ \text{0} & & \text{1} & & & & \text{0} \end{array}$$
$$\mathfrak{A} \quad \begin{array}{c} \text{red} \\ 0 \end{array} \quad \begin{array}{c} \text{black} \\ 1 \end{array} \quad \begin{array}{c} \text{blue} \\ 0 \end{array} \quad \mathfrak{q}$$





$$\Delta_{\vec{q}} = \frac{\omega}{0} - \frac{\omega}{1} + \frac{\omega}{5} - \frac{\omega}{7} + \frac{\omega}{9} - \frac{\omega}{11} + \dots$$
[illegible]

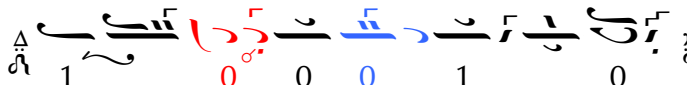
100010

A diagram showing a sequence of operations on a number line. The number line has points labeled 1, 0, 0, 1, 0. Above the line, there are arrows and symbols: a blue arrow from 1 to 0, a red arrow from 0 to 0, a blue arrow from 0 to 1, and a blue arrow from 1 to 0. There are also some symbols like 'A' and 'q'.

$$\frac{\partial}{\partial t} = 0 \quad \frac{\partial}{\partial x} = 0$$

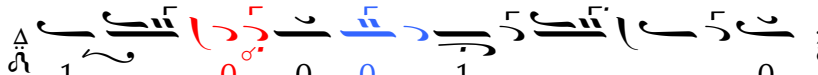
Plagal First Mode - Sticheraric

100010



0 0

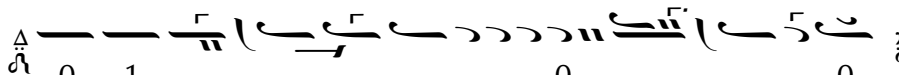
100010




0 0

Accented on third to last syllable:

0100



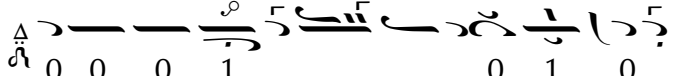
01000100



0 1

Accented on fourth to last syllable:

0001010



0 0 0 1 0 1 0

H) Medial Formulae Ke - Pa

This section is almost empty, because melodies in this mode usually pause at Di before descending to Pa.

Accented on last syllable:

001100001

Accented on second to last syllable:

0010010

0X0X010

Accented on third to last syllable:

10100

0100100

Accented on fourth to last syllable:

001001

011001

Plagal First Mode - Sticheraric

0X0X010	$\frac{x}{q}$ π q
01001001	$\frac{x}{q}$ π q

I) Medial Formulae Ke - Di

Accented on last syllable:

$$0 \quad \overset{x}{\underset{0}{q}} \quad \overset{\Delta}{\underset{0}{\mathfrak{A}}}$$
$$\ddot{q} \sim \ddot{\Delta}$$

01

$$000 \quad \overset{x}{\underset{\cdot}{q}} \quad \overset{\cdot}{0} \quad \overset{\cdot}{0} \quad \overset{\cdot}{0} \quad \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$$

001 $\begin{array}{ccc} \overline{x} & \overline{y} & \overline{z} \\ \overline{q} & 0 & 1 \\ \Delta & \Delta & \Delta \end{array}$

$$\begin{array}{ccccccc} x & \curvearrowright & \text{---} & \text{---} & \Delta \\ \ddot{q} & & & & \ddot{q} \\ 0 & 0 & 1 & & \end{array}$$

0001 $\frac{x}{q}$ 0 0 0 1 $\frac{\Delta}{\delta}$

$$\begin{array}{ccccccc} \begin{array}{c} \text{L} \\ \text{0} \end{array} & \begin{array}{c} \text{L} \\ \text{0} \end{array} & \begin{array}{c} \text{L} \\ \text{0} \end{array} & \begin{array}{c} \text{L} \\ \text{1} \end{array} & \begin{array}{c} \Delta \\ \text{0} \end{array} \end{array}$$

00101

$\frac{x}{q}$

 0 0 1 0 1 $\frac{\Delta}{\delta}$

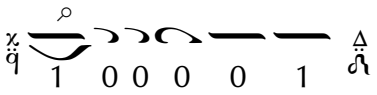
$\frac{x}{q}$
 $\frac{1}{0}$
 $\frac{1}{0}$
 $\frac{1}{1}$
 $\frac{1}{0}$
 $\frac{1}{1}$
 $\frac{1}{1}$

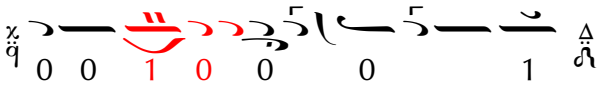

10001

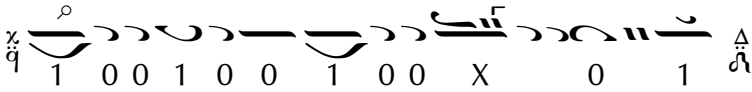
$\frac{x}{q}$
 $\frac{\rho}{1}$
 $\frac{1}{0}$
 $\frac{1}{0}$
 $\frac{1}{0}$
 $\frac{1}{1}$
 $\frac{\Delta}{\mathfrak{A}}$

$$\frac{x}{q} \frac{\overline{1}}{1} \frac{\overline{0}}{0} \frac{\overline{0}}{0} \frac{\overline{0}}{0} \frac{\overline{1}}{1} \frac{\overline{0}}{0}$$

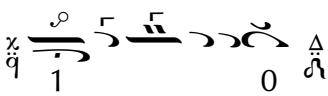
Plagal First Mode - Sticheraric

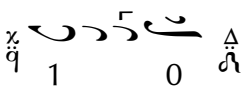
100001 


0010001  


100100100X01 

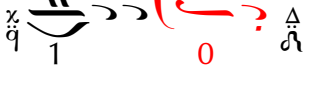
Accented on second to last syllable:


10 




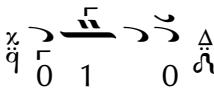












010 





Plagal First Mode - Sticheric

00010

$\frac{\%}{q}$ 0 0 0 1 0 $\frac{\Delta}{\delta}$

10010

$\frac{x}{q}$
 $\frac{1}{1}$
 $\frac{0}{0}$
 $\frac{0}{0}$
 $\frac{1}{1}$
 $\frac{0}{0}$
 $\frac{1}{1}$
 $\frac{0}{0}$
 $\frac{1}{1}$

$\frac{x}{q}$
 $\frac{1}{1}$
 $\frac{0}{0}$
 $\frac{1}{1}$
 $\frac{0}{0}$
 $\frac{\Delta}{\Delta}$

1

1

000010 $\overset{\chi}{\underset{q}{\curvearrowright}} \overset{\curvearrowright}{\underset{0}{\curvearrowright}} \overset{\curvearrowright}{\underset{0}{\curvearrowright}} \overset{\curvearrowright}{\underset{0}{\curvearrowright}} \overset{\curvearrowright}{\underset{0}{\curvearrowright}} \overset{\curvearrowright}{\underset{1}{\curvearrowright}} \overset{\curvearrowright}{\underset{0}{\curvearrowright}} \overset{\Delta}{\underset{\mathfrak{A}}{\curvearrowright}}$

100010

$\frac{x}{q}$ 1 0 0 0 1 0 $\frac{\Delta}{\delta}$

$\chi_{\bar{q}}^{\rho}$
 $\frac{1}{1}$
 0
 0
 0
 1
 0
 $\frac{\Delta}{\bar{q}}$

$\chi_{\vec{q}}$
 $\frac{\rho}{1}$
 $\frac{\sigma}{0}$
 $\frac{\tau}{0}$
 $\frac{\eta}{0}$
 $\frac{\zeta}{1}$
 $\frac{\xi}{0}$
 $\Delta_{\vec{q}}$

$\frac{x}{q}$

1 0 0 0 1 0 0 Δ_q

1 0

0010010 $\frac{x}{q}$ 0 0 1 0 0 1 0 $\frac{\Delta}{\delta}$

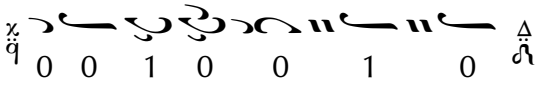
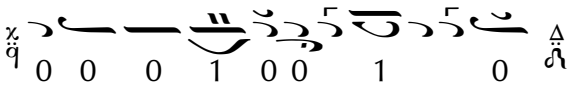
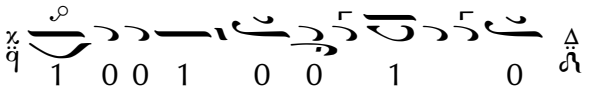

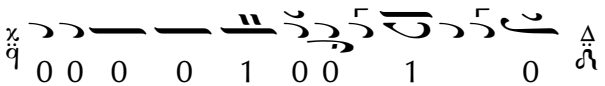
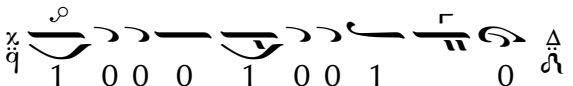
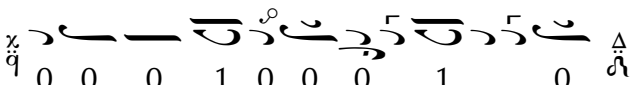
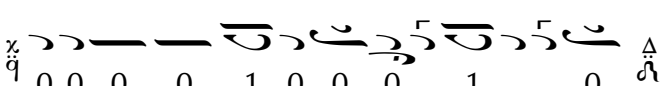

$\frac{x}{q}$

0 0 1 0 0 1 0




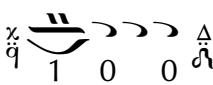

Δ

δ

Plagal First Mode - Sticheraric

	
00010010	
10010010	
000010010	
	
100010010	
000100010	
0000100010	
100100100010	

Accented on third to last syllable:

100		
		
		
0100		

Plagal First Mode - Sticheraric

0 1 0 0

0 1 0 0

0 1 0 0

0101

0 1 0 1

00100

0 0 1 0 0

0

0 0 1 0 0

1 0

00101

0 0 1 0 1

0 0 1 0 1

10100

1 0 1 0 0

000100

0 0 0 1 0 0

0

0 0 0 1 0 0

0X0100

0 X 0 1 0 0

100100

1 0 0 1 0 0

1 0 0 1 0 0

1 0 0 1 0 0

Plagal First Mode - Sticheraric

100110

0000100

0010100

00010100

100100100100100

Accented on fourth to last syllable:

1010

001001

0001010

00001010

1000001010

100100101010

J) Medial Formulae Ke - Ke

Many of these formulae may be used as Pa-Ke formula simply by prefixing them with a jump of five or by adding five to the first character.

Accented on last syllable:

$$01 \quad \begin{array}{c} \overline{x} \quad \overline{y} \\ \overline{q} \quad 0 \quad 1 \quad \overline{q} \end{array}$$

11 $\overset{x}{\underset{\cdot}{q}} \overset{\curvearrowright}{\underset{1}{\text{U}}} \overset{\curvearrowright}{\underset{1}{\text{U}}} \overset{x}{\underset{\cdot}{q}}$

001 $\frac{x}{q}$ 0 0 1 $\frac{x}{q}$ 1

$$0001 \quad \begin{array}{cccc} \overline{x} & \overline{y} & \overline{z} & x \\ \overline{q} & 0 & 0 & \overline{q} \\ 0 & 0 & 0 & 1 \end{array}$$

0001 $\frac{x}{q} \curvearrowright \frac{r}{0} \curvearrowright \frac{r}{0} \curvearrowright \frac{r}{0} \curvearrowright \frac{r}{1} \curvearrowright \frac{r}{1} \curvearrowright \frac{x}{q}$

$$\frac{f}{0} \rightsquigarrow \frac{f}{1}$$

0 1

$$\frac{\omega}{0} \quad \frac{\omega}{1} \quad \frac{\omega}{5}$$

X001

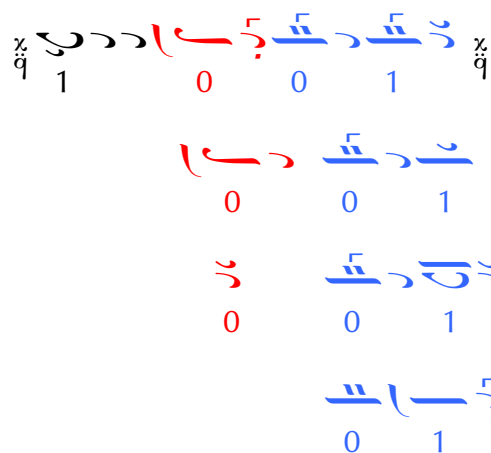
0 + 0 = 0

0 0 1

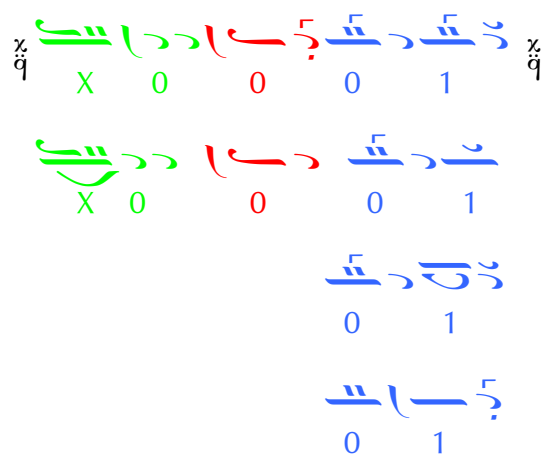
$$\frac{\omega}{0} \quad \frac{\omega}{1} \quad \frac{\omega}{5}$$

Plagal First Mode - Sticheraric

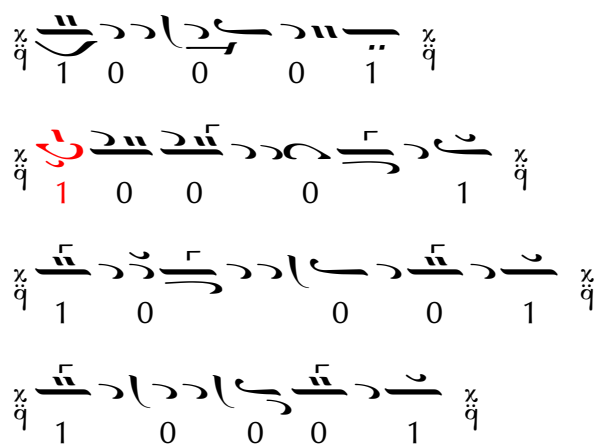
1001



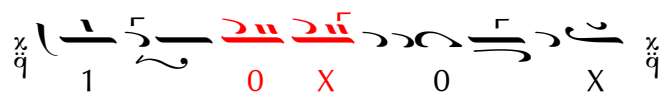
X0001



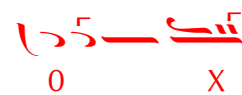
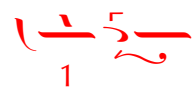
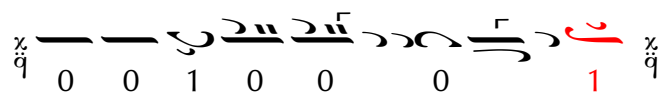
10001



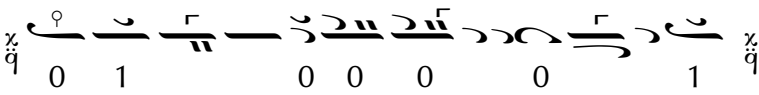
10X0X

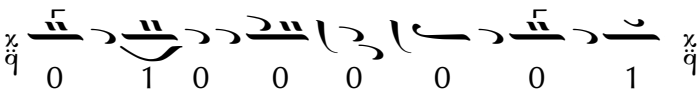


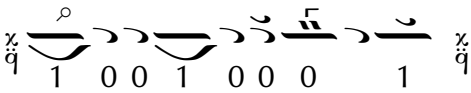
0010001



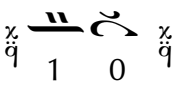
Plagal First Mode - Sticheraric

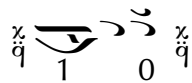
0100001 

01000001 

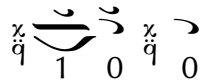
10010001 

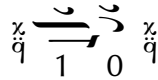
Accented on second to last syllable:

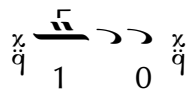
10 

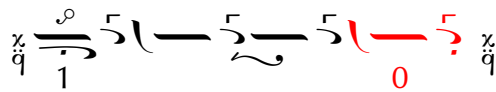






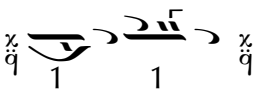


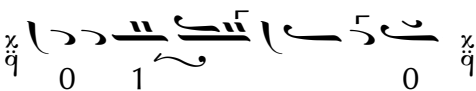






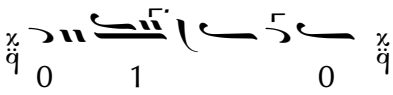
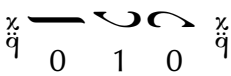


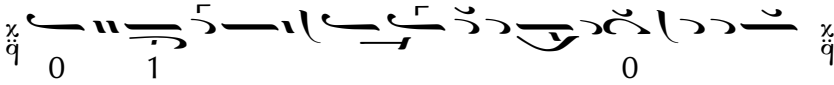
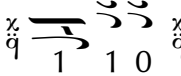
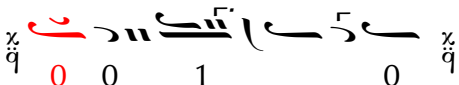
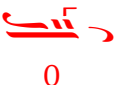
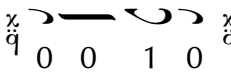
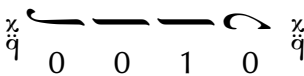
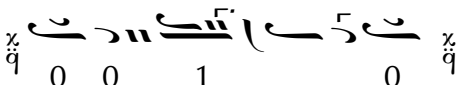
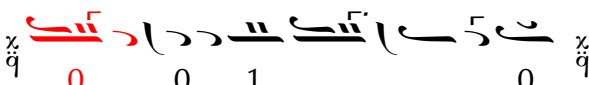

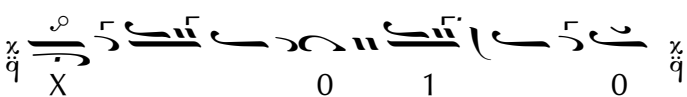
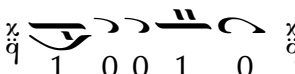
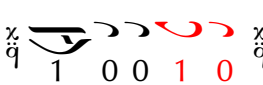




11 

010 



Plagal First Mode - Sticheraric

		
		
		
		
110		
0010		
		
		
		
		
X010		
10010		
		
		

Plagal First Mode - Sticheraric

$\frac{x}{q} \overline{\cup} \cup \text{---} \overline{\cup} \cup \cup \frac{x}{q}$
1 0 0 1 0

$\frac{x}{q} \overline{\cup} \cup \cup \cup \overline{\cup} \cup \cup \cup \frac{x}{q}$
1 0 0 1 0

$\frac{x}{q} \text{---} \overline{\cup} \text{---} \overline{\cup} \cup \cup \cup \cup \text{---} \overline{\cup} \cup \cup \cup \cup \frac{x}{q}$
1 0 0 1 0

$\frac{x}{q} \overline{\cup} \cup \cup \cup \overline{\cup} \cup \cup \cup \frac{x}{q}$ 1 0 0 1 0 $\frac{x}{q}$ 1 1

00010

$\frac{x}{q} \cup \text{---} \text{---} \overline{\cup} \cup \frac{x}{q}$
0 0 0 1 0

$\frac{x}{q} \cup \cup \cup \overline{\cup} \cup \frac{x}{q}$
0 0 0 1 0

$\frac{x}{q} \overline{\cup} \cup \cup \cup \cup \cup \cup \cup \cup \frac{x}{q}$
0 0 0 1 0

010010

$\frac{x}{q} \overline{\cup} \overline{\cup} \overline{\cup} \text{---} \cup \cup \cup \cup \cup \cup \frac{x}{q}$ 1 1

$\frac{x}{q} \overline{\cup} \text{---} \overline{\cup} \text{---} \overline{\cup} \cup \cup \cup \cup \cup \cup \frac{x}{q}$ 0 1 0 0 1 0 $\frac{x}{q}$ 0 0 0 0

$\frac{x}{q} \overline{\cup} \text{---} \overline{\cup} \text{---} \overline{\cup} \cup \cup \cup \cup \cup \cup \frac{x}{q}$
0 1 0 0 1 0

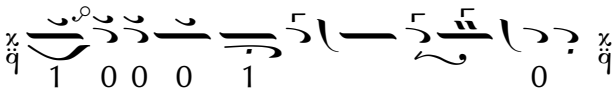
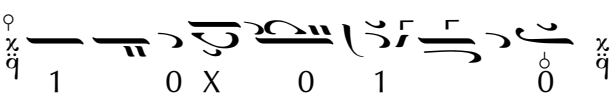
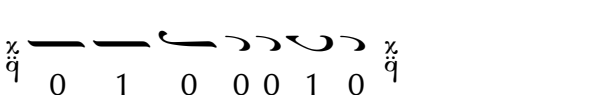
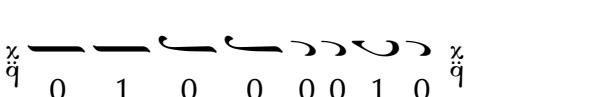
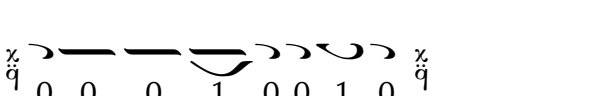
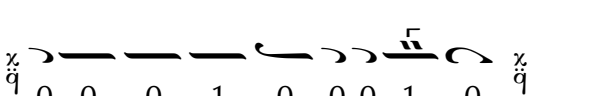
100010

$\frac{x}{q} \overline{\cup} \cup \cup \text{---} \cup \cup \frac{x}{q}$
1 0 0 0 1 0


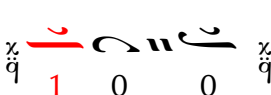

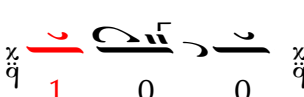

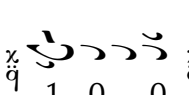
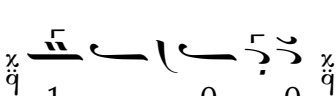
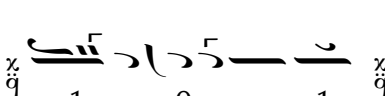
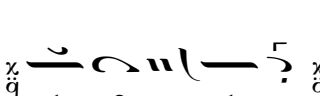
$\frac{x}{q} \overline{\cup} \cup \cup \cup \cup \overline{\cup} \cup \cup \cup \frac{x}{q}$ 1 0 0 0 1 0 $\frac{x}{q}$ 1 0 0

$\frac{x}{q} \text{---} \cup \cup \cup \cup \cup \frac{x}{q}$
1 0 0 0 1 0

Plagal First Mode - Sticheraric

	
10X010	
0100010	
01000010	
00010010	
000100010	

Accented on third to last syllable:

100		
		
		
		
		
101		
		

Plagal First Mode - Sticheric

110

0100

$$\begin{array}{ccccccc} \times & \text{---} & \text{---} & \text{---} & \text{---} & \times \\ \ddot{q} & & & & & \ddot{q} \\ & 0 & 1 & 0 & 0 & \end{array}$$
$$\begin{array}{ccccccc} \ddot{q} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \ddot{q} \\ & 0 & 1 & 0 & 0 & & \end{array}$$
$$\begin{array}{ccccccccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ \frac{x}{q} & & & & & & & & & & \frac{x}{q} \\ 0 & 1 & & & 0 & 0 & & & & & \end{array}$$
$$\frac{x}{q} \left(0 \quad 1 \quad \frac{r}{\sigma} \right) \begin{matrix} r \\ \text{---} \\ r \end{matrix} \begin{matrix} r \\ \text{---} \\ r \end{matrix} \left(0 \quad 0 \right) \frac{x}{q}$$
$$\underbrace{\quad}_0 \underbrace{\quad}_1 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_0$$
$$\frac{x}{q} \quad \frac{1}{0} \quad \frac{1}{1} \quad \frac{1}{0} \quad \frac{1}{1} \quad \frac{1}{0} \quad \frac{1}{1} \quad \frac{1}{0} \quad \frac{1}{1} \quad \frac{1}{0} \quad \frac{1}{1} \quad \frac{x}{q}$$

$\begin{matrix} x \\ \dot{q} \end{matrix}$
—
⌞
⌞
⌞
 $\begin{matrix} x \\ \dot{q} \end{matrix}$

X100

1X00

00100

X0100

Plagal First Mode - Sticheric

10100

10X0X

000100

010100

100100

0100100

Plagal First Mode - Sticheraric

1000100 $\frac{\%}{q}$ — — — — — — — — — — $\frac{\%}{q}$
 1 0 0 0 1 0 0

X100100 $\frac{\%}{q}$ — — — — — — — — — — $\frac{\%}{q}$
 X 1 0 0 1 0 0

— — — — — — — — — —
 0 0 0

— — — — — — — — — —
 1 0 0

00100100 $\frac{\%}{q}$ — — — — — — — — — — $\frac{\%}{q}$
 0 0 1 0 0 1 0 0

— — — — — — — — — —
 0 0 0

01000100 $\frac{\%}{q}$ — — — — — — — — — — $\frac{\%}{q}$
 0 1 0 0 0 1 0 0

001000100 $\frac{\%}{q}$ — — — — — — — — — — $\frac{\%}{q}$
 0 0 1 0 0 0 1 0 0

— — — — — — — — — —
 0 0

— — — — — — — — — —
 0 0

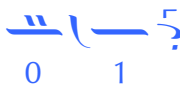
Accented on fourth to last syllable:

X001 $\frac{\%}{q}$ — — — — — — — — — — $\frac{\%}{q}$
 X 0 0 1

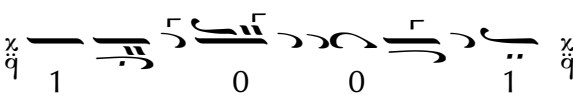
— — — — — — — — — —
 0 0 1

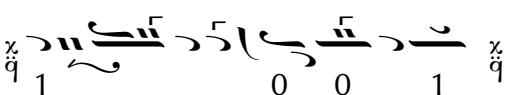
— — — — — — — — — —
 0 0 1

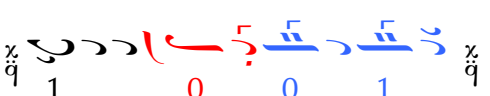
Plagal First Mode - Sticheraric





1001






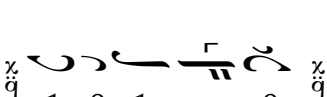








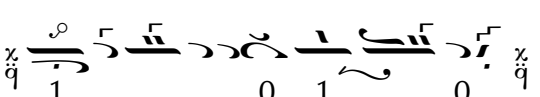


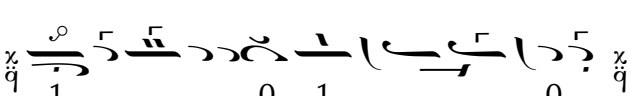
1010



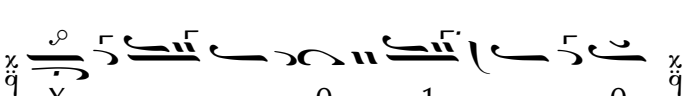




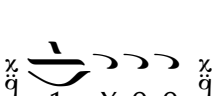




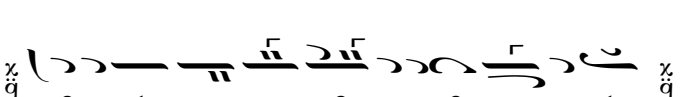
X010



1X00



01001



Plagal First Mode - Sticheraric

	$\frac{x}{q}$ $\frac{x}{q}$	
	$\frac{x}{q}$ $\frac{x}{q}$	
001010	$\frac{x}{q}$ $\frac{x}{q}$	
X01001	$\frac{x}{q}$ $\frac{x}{q}$	
1001001	$\frac{x}{q}$ $\frac{x}{q}$	
0101001	$\frac{x}{q}$ $\frac{x}{q}$	
00101001	$\frac{x}{q}$ $\frac{x}{q}$	

K) Medial Formulae Ke - High Nee

These must be followed by a formula in section L1 or L2.

Accented on last syllable:

$$0001 \quad \frac{0}{0} \quad \frac{1}{0} \quad \frac{1}{0} \quad \frac{1}{1} \quad \frac{1}{1}$$

10001

$\frac{x}{q}$ 1 0 0 0 1 $\frac{y'}{n}$

010001

x'

0 1 0 0 0 1 1

0 1 1

010001

$\frac{x}{q}$ 0 1 0 0 0 1 $\frac{y'}{n}$

0 1

0100X0X

00010001

$\frac{x}{q}$ 0 0 0 1 0 0 0 1 $\frac{y}{n}$

0 1

0001000100 $\frac{x}{q}$ 0 0 0 1 0 0 0 1 0 0 0 1 $\frac{y}{n}$

Accented on second to last syllable:

$$00 \quad \overset{x}{q} \overset{\curvearrowright}{\underset{0}{\text{---}}} \overset{\curvearrowright}{\underset{0}{\text{---}}} \overset{y'}{n}$$

Plagal First Mode - Sticheric

$$\begin{array}{c} 010 \\ \begin{array}{ccccc} \overline{x} & \overline{q} & \overline{1} & \overline{0} & \overline{n'} \\ 0 & 1 & 0 & & \end{array} \\ \begin{array}{ccccc} \overline{x} & \overline{q} & \overline{1} & \overline{0} & \overline{n'} \\ 0 & 1 & 0 & & \end{array} \end{array}$$

Accented on third to last syllable:

100 $\frac{x}{q}$ 1 0 0 $\frac{y}{n}$ 0 0 $\frac{x}{q}$

0100 $\frac{x}{q}$ 0 1 0 0 $\frac{x'}{n}$ 0 $\frac{x}{q}$

00100

$\frac{x}{q}$
 $\frac{1}{0}$
 $\frac{1}{0}$
 $\frac{1}{1}$
 $\frac{1}{0}$
 $\frac{1}{0}$
 $\frac{y'}{n}$

0100X0X

00010010X

$\overset{x}{q}$
 $\overset{y'}{n}$

010010010X

π_q $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{00}$ $\frac{1}{1}$ $\frac{1}{001}$ $\frac{1}{0}$ $\frac{1}{X}$ $\frac{1}{n}$

000100010X

$\frac{x}{q}$

0 0 0 1 0 0 0 1 0 X

$\frac{y'}{n}$

[illegible]

00100011000100

$\begin{array}{ccccccccccccccc} \text{\tiny \times} & \text{\tiny \dot{q}} & \rule{0.8em}{0.4pt} & \rule{0.8em}{0.4pt} & \rule{0.8em}{0.4pt} & \rule{0.8em}{0.4pt} & \rule{0.8em}{0.4pt} & \rule{0.8em}{0.4pt} & \rule{0.8em}{0.4pt} & \rule{0.8em}{0.4pt} & \rule{0.8em}{0.4pt} & \rule{0.8em}{0.4pt} & \rule{0.8em}{0.4pt} & \rule{0.8em}{0.4pt} & \rule{0.8em}{0.4pt} \\ 0 & 0 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 0 \end{array}$

Plagal First Mode - Stichericaric

Accented on fourth to last syllable:

$$1001 \quad \frac{\gamma}{q} \frac{\gamma}{1} \frac{\gamma}{0} \frac{\gamma}{0} \frac{\gamma}{1} \gamma'$$

01001 $\frac{x}{q} \frac{1}{0} \frac{1}{1} \frac{1}{0} \frac{1}{0} \frac{1}{1} \frac{1}{n}$

L1) Medial Formulae High Nee - High Nee

0001	$\overset{\vee'}{\text{u}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{1}{\text{—}} \overset{\vee'}{\text{u}}$
0010	$\overset{\vee'}{\text{u}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{0}{\text{—}} \overset{\vee'}{\text{u}}$
0100	$\overset{\vee'}{\text{u}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \overset{\vee'}{\text{u}}$
	$\overset{\vee'}{\text{u}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \overset{\vee'}{\text{u}}$

L2) Medial Formulae High Nee - Ke


Accented on last syllable:

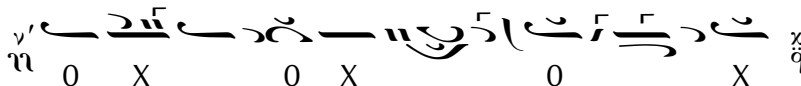
(Use a formula below ending in X0X)


Accented on second to last syllable:

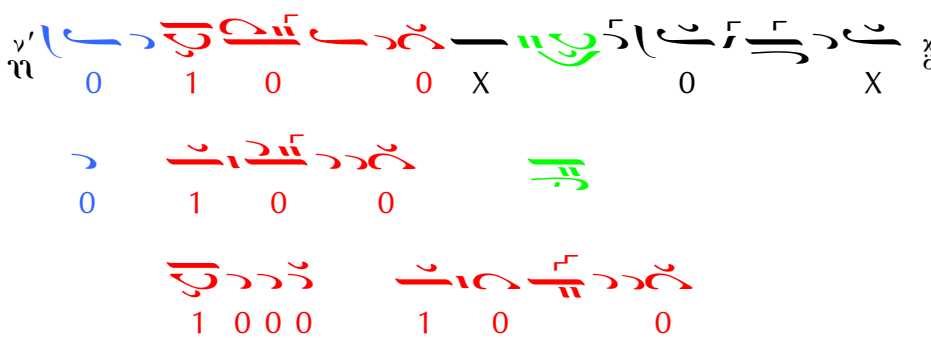
0010	$\overset{\vee'}{\text{u}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{0}{\text{—}} \overset{\times}{\underset{\cdot}{\underset{\cdot}{\text{q}}}}$
0010010	$\overset{\vee'}{\text{u}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{0}{\text{—}} \overset{\times}{\underset{\cdot}{\underset{\cdot}{\text{q}}}}$
	$\overset{\vee'}{\text{u}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{0}{\text{—}} \overset{\Delta}{\underset{\cdot}{\underset{\cdot}{\text{a}}}}$
0100010	$\overset{\vee'}{\text{u}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{0}{\text{—}} \overset{\times}{\underset{\cdot}{\underset{\cdot}{\text{q}}}}$
00010010	$\overset{\vee'}{\text{u}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{0}{\text{—}} \overset{\times}{\underset{\cdot}{\underset{\cdot}{\text{q}}}}$
01000010	$\overset{\vee'}{\text{u}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{0}{\text{—}} \overset{\times}{\underset{\cdot}{\underset{\cdot}{\text{q}}}}$

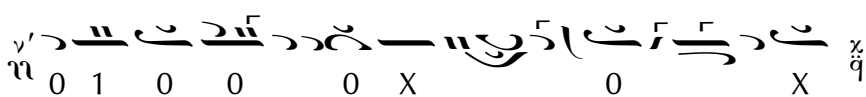
Accented on third to last syllable:

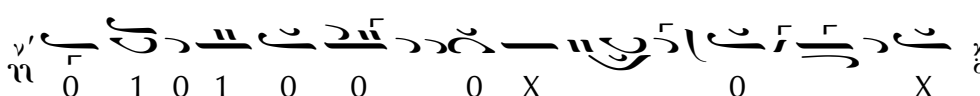
10X0X 

0X0X0X 

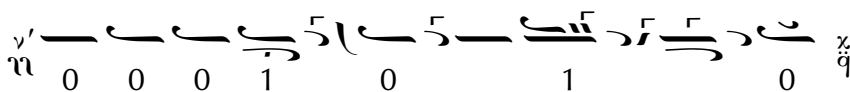
0010X0X 

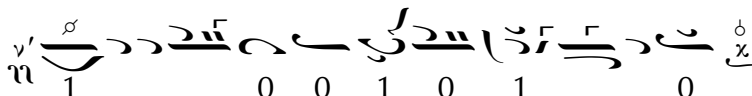
0100X0X 

01000X0X 

0101000X0X 

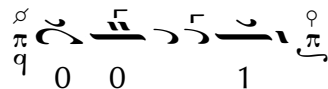
Accented on fourth to last syllable:

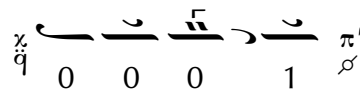
0001010 

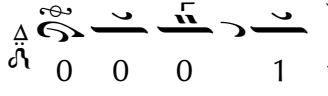
1001010 

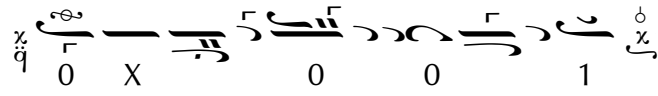
M) Fthoras

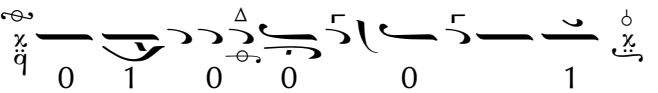
Accented on last syllable:

001 

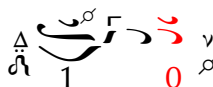



0001 

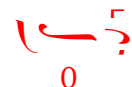
0X001 


010001 

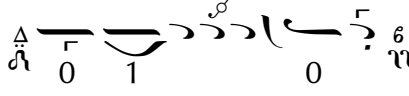
Accented on second to last syllable:

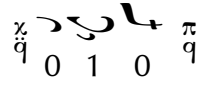
10 

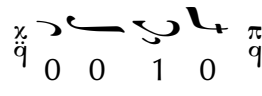
010 

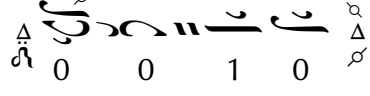


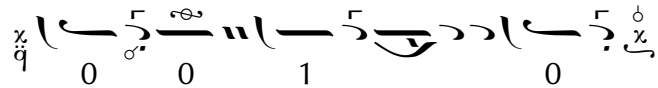






0010 





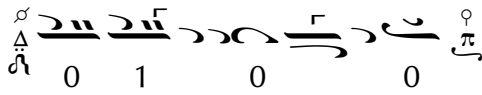
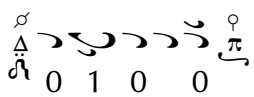
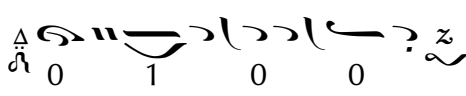
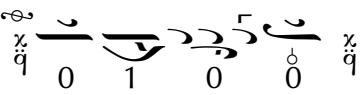
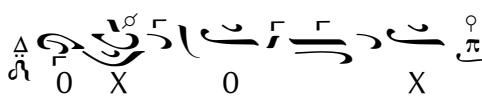


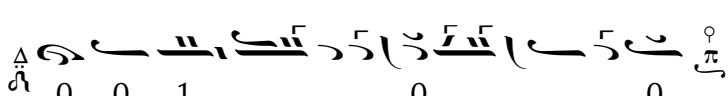
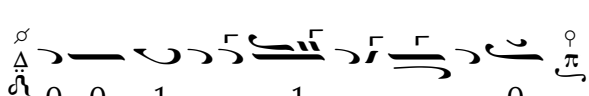
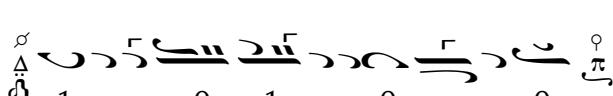
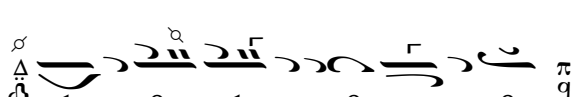
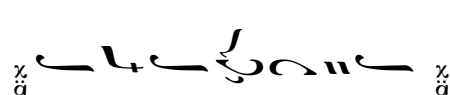
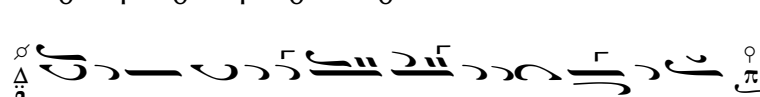
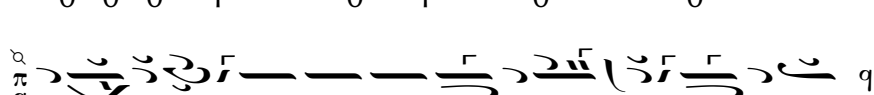
Plagal First Mode - Sticheraric

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010010		
000010		
010X010		
0010010		
100010		
1010X010		
00100X010		
100X01000010		

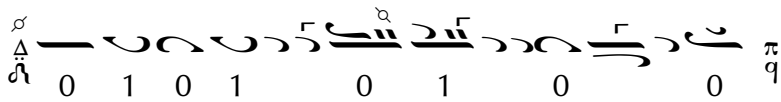
Accented on third to last syllable:

100	
0100	

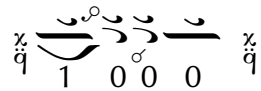
Plagal First Mode - Sticheraric

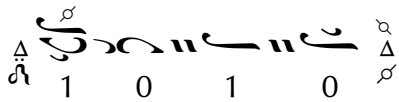
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010100	
00010100	
01000100	

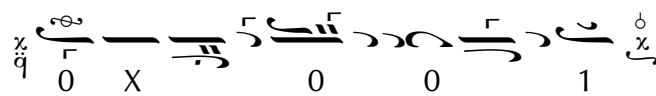
Plagal First Mode - Sticheraric

01010100 


Accented on fourth to last syllable:


1000 

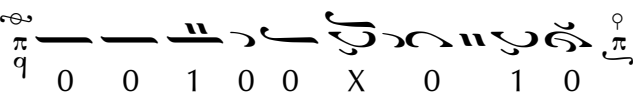
1010 

0X001 

01001 

010X010 

1010X010 

00100X010 



N) Old (slow) Sticheraric Formulae

Accented on last syllable:

$$01 \quad \pi_q \quad \underbrace{\quad}_0 \quad \underbrace{\quad}_1 \quad \underbrace{\quad}_2 \quad \underbrace{\quad}_q$$
[illegible][illegible][illegible][illegible]

001 $\frac{\Delta}{\delta_1} \frac{\delta_2}{0} \frac{\delta_3}{0} \frac{\delta_4}{1} \frac{\delta_5}{\pi_q}$

001

$\frac{A}{d} \rightarrow \frac{B}{0} \rightarrow \frac{C}{0} \rightarrow \frac{D}{1} \rightarrow \frac{E}{\sim} \rightarrow \frac{F}{\sim} \rightarrow \frac{G}{2} \rightarrow \frac{H}{-} \rightarrow \frac{I}{+} \rightarrow \frac{J}{\sim} \rightarrow \frac{K}{\sim} \rightarrow \frac{L}{0} \rightarrow \frac{M}{1}$

%q

001

$\frac{x}{q} \left(\underbrace{\overline{0}}_0 - \underbrace{\overline{0}}_0 = \underbrace{\overline{1}}_1 \right) \sim \underbrace{\overline{5}}_5 - \underbrace{\overline{6}}_6 \sim \underbrace{\overline{7}}_7 + \left(\underbrace{\overline{-1}}_0 - \underbrace{\overline{-5}}_0 \right) \sim \underbrace{\overline{6}}_6$

$$\frac{1}{1} \frac{x}{q}$$

0001

$\frac{x}{q} \quad \overline{0} \rightarrow \overline{5} \left(\begin{array}{c} \overline{9} \\ \overline{0} \end{array} \right) \rightarrow \overline{0} \rightarrow \overline{1} \rightsquigarrow \overline{6} \rightarrow \overline{5} \rightarrow \overline{7} \rightarrow \overline{5} \overline{8} + (\overline{1} \rightarrow \overline{5}) \rightarrow \overline{0}$

$$\begin{array}{c} \text{~}\overline{\text{~}}\overline{\text{~}}\overline{\text{~}}\overline{\text{~}} \\ 0 \quad 1 \end{array} \quad x_q$$
[illegible]

Plagal First Mode - Sticheraric

010001 π $\frac{\Delta}{q}$ $\frac{0}{1}$ $\frac{1}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{1}{1}$ $\frac{\Delta}{q}$

010001 $\frac{\Delta}{q}$ $\frac{0}{1}$ $\frac{1}{0}$ $\frac{0}{0}$ $\frac{0}{1}$ $\frac{\Delta}{q}$

010001 $\frac{\phi}{q}$ $\frac{0}{1}$ $\frac{1}{0}$ $\frac{0}{0}$ $\frac{0}{1}$ $\frac{\phi}{q}$

010001 $\frac{\phi}{q}$ $\frac{0}{1}$ $\frac{1}{0}$ $\frac{0}{0}$ $\frac{0}{1}$ $\frac{\phi}{q}$

010X01 $\frac{x}{q}$ $\frac{0}{1}$ $\frac{1}{0}$ $\frac{0}{1}$ $\frac{x}{q}$

0100001 $\frac{x}{q}$ $\frac{0}{1}$ $\frac{1}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{1}{1}$ $\frac{x}{q}$

0100001 $\frac{x}{q}$ $\frac{0}{1}$ $\frac{1}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{1}{1}$ $\frac{x}{q}$

Accented on second to last syllable:

10 $\frac{\Delta}{q}$ $\frac{1}{0}$ $\frac{0}{1}$ $\frac{0}{0}$ $\frac{0}{1}$ $\frac{\Delta}{q}$

10 $\frac{\pi}{q}$ $\frac{1}{0}$ $\frac{0}{1}$ $\frac{0}{0}$ $\frac{\pi}{q}$

10 $\frac{x}{q}$ $\frac{1}{0}$ $\frac{0}{1}$ $\frac{0}{0}$ $\frac{x}{q}$

10 $\frac{\phi}{q}$ $\frac{1}{0}$ $\frac{0}{1}$ $\frac{0}{0}$ $\frac{\phi}{q}$

Plagal First Mode - Stichericaric

[illegible]

Plagal First Mode - Sticheric

010


010

010

$$(-\frac{1}{f})^{\frac{1}{n}} (-\frac{1}{f})^{\frac{1}{n}} \approx (-\frac{1}{f})^{\frac{1}{n}} (-\frac{1}{f})^{\frac{1}{n}}$$
[illegible]
$$\begin{array}{ccccccc} \gamma & + & \frac{1}{\gamma} & \gamma & \frac{1}{\gamma} & \frac{1}{\gamma} & \frac{1}{\gamma} \\ 0 & & 1 & & 0 & & 0 \end{array}$$

010

0010





0

0010

0010

0010

0010

Plagal First Mode - Sticheric

[illegible]

Plagal First Mode - Sticheraric

100010

100010

0100010

Accented on third to last syllable:

100

100

100

100

100

100

Plagal First Mode - Stichericaric

100 $\frac{1}{q}$ 1 0 2

$$(-)^{+} (-)^{\frac{1}{2}} \underbrace{(-)^{\frac{1}{2}}}_{0} (-)^{\frac{1}{2}}_{0} x_q$$
[illegible]
$$\frac{1}{r} \left(\frac{1}{r} - \frac{1}{r_0} \right) = \frac{1}{r} \left(\frac{1}{r} - \frac{1}{r_0} \right)$$
[illegible][illegible][illegible]

A diagram showing a 2D coordinate system with two basis vectors, e_0 and e_1 , originating from the origin. e_0 is a horizontal vector pointing to the right, and e_1 is a vertical vector pointing upwards. The vectors are labeled with their respective indices, 0 and 1, below them.

0100 π_9 $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{2}$ $\frac{1}{0}$ $\frac{1}{2}$ $\frac{1}{0}$ π_9

$$0100 \quad \frac{\%}{q} \frac{1}{0} \frac{2}{1} \frac{3}{\sim} \frac{4}{0} + \frac{5}{0} \frac{6}{1} \frac{7}{\sim} \frac{8}{0} \frac{9}{0} \frac{\%}{q}$$

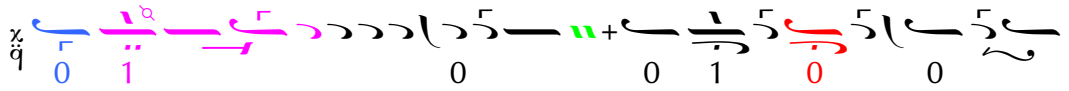
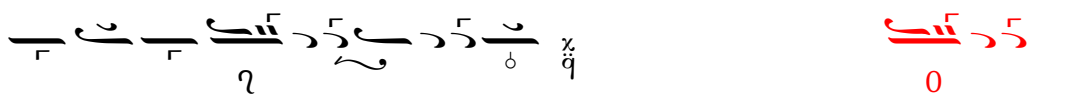
0100 π_q $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{2}$ $\frac{1}{0}$ π_q

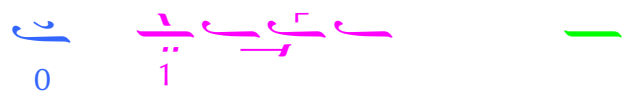
0100

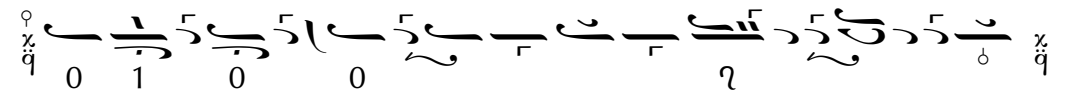
0100 Δ
 δ 0 1 0 2 0 $\frac{x}{q}$

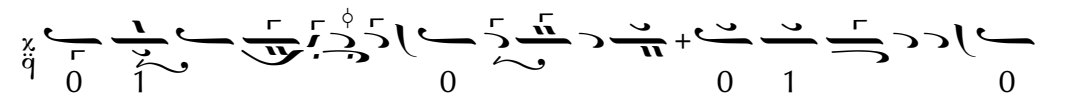
$$0100 \quad \frac{\Delta}{\delta} \frac{0}{0} \frac{1}{1} \frac{1}{0} + \frac{1}{0} \frac{1}{1} \frac{1}{0} \frac{1}{0} \frac{1}{0} \frac{1}{0} \quad \pi_q$$

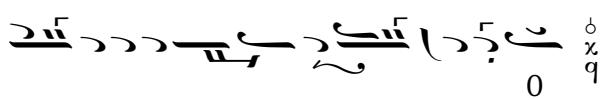
Plagal First Mode - Sticheraric


0100 $\frac{\text{q}}{\text{q}}$  $\frac{\text{q}}{\text{q}}$ 



0100 $\frac{\text{q}}{\text{q}}$ 

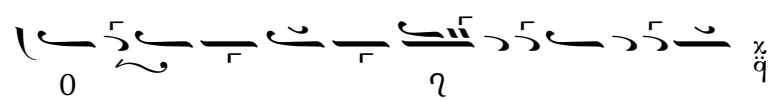
0100 $\frac{\text{q}}{\text{q}}$ 

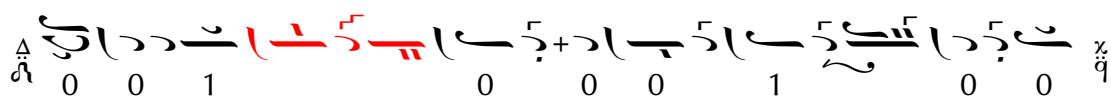


0100 $\frac{\text{A}}{\text{A}}$ 

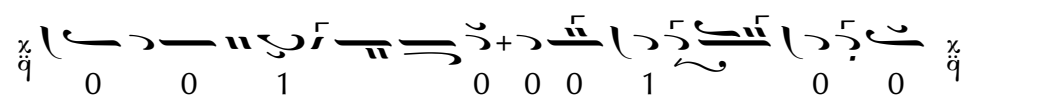
0100 $\frac{\text{q}}{\text{q}}$ 

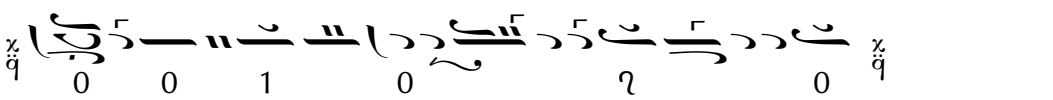
0100 $\frac{\text{q}}{\text{q}}$ 



00100 $\frac{\text{A}}{\text{A}}$ 



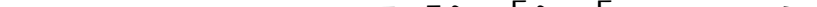
00100 $\frac{\text{q}}{\text{q}}$ 

00100 $\frac{\text{q}}{\text{q}}$ 

Plagal First Mode - Sticheric

00100


$$\begin{array}{ccccccc} \text{1} & \text{2} & \text{3} & \text{4} & \text{5} & \text{6} & \text{7} \\ \text{1} & \text{0} & \text{0} & \text{0} & \text{0} & \text{0} & \text{0} \end{array}$$

00100 π_q  $\frac{x}{q}$

00100

$\frac{x}{q}$

0 0 1 0 0

00100 

$$\frac{\Gamma}{0} \pi q$$

00100

$\frac{A}{d}$

0 0 1 + 0 1 0 0

πq

00100

Δ
0 0 1 0 0

Diagram illustrating the binary sequence 00100, with the third bit (1) highlighted in red.

$$\begin{array}{c} \pi \\ 0 \end{array} \quad \begin{array}{c} \pi \\ 1 \end{array}$$

π_q

$$\begin{array}{c} \text{1} \text{ 5} \text{ 1} \text{ 2} \text{ 2} \\ \text{0} \end{array} \quad \begin{array}{c} \pi \\ q \end{array}$$

00100

[illegible]

Plagal First Mode - Sticheric

00100

$$\begin{array}{c} \text{A} \\ \text{d} \end{array} \begin{array}{ccccccc} \overline{\text{d}} & \text{d} & \text{d} & \text{d} & \text{d} & \text{d} & \text{d} \\ 0 & 0 & 1 & & & 0 & \end{array}$$

$$\begin{array}{ccccccc} \text{d} & \text{d} & \text{d} & \text{d} & \text{d} & \text{d} & \text{d} \\ \chi^\alpha & & & & & & \end{array}$$

$$\begin{array}{ccc} \text{d} & \text{d} & \text{d} \\ 0 & 0 & \pi_q \end{array}$$

00100

10100

[illegible]

10100

$\frac{x}{q}$
 $\frac{1}{1}$
 $\frac{0}{0}$
 $\frac{1}{1}$
 $\frac{2}{2}$
 $\frac{3}{3}$
 $\frac{4}{4}$
 $\frac{5}{5}$
 $\frac{6}{6}$
 $\frac{7}{7}$
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 $\frac{207}{207}$
 $\frac{208}{208}$
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 $\frac{259}{259}$
 $\frac{260}{260}$
 $\frac{261}{261}$
 $\frac{262}{262}$
 $\frac{263}{263}$
 $\frac{264}{264}$
 $\frac{265}{265}$
 $\frac{266}{266}$
 $\frac{267}{267}$

000100

$\frac{x}{q}$

0 0 0 1 0

2 0

0 0 1 0 0 $\frac{x}{q}$

Plagal First Mode - Sticheraric

010100 $\frac{\pi}{q}$ 0 1 0 1 0 0 1 0

0 $\frac{\pi}{q}$

100100 $\frac{\pi}{q}$ 1 0 0 1 0 0 $\frac{\pi}{q}$

100100 $\frac{\Delta}{q}$ 1 0 0 1 0 0 0

0 $\frac{\pi}{q}$

0100100 $\frac{\Delta}{q}$ 0 1 0 0 1 0

0 $\frac{\pi}{q}$

0100100 $\frac{\pi}{q}$ 0 1 0 0 0

1 0 1 0 0 $\frac{\delta}{q}$

0100100 $\frac{\pi}{q}$ 0 1 0 0 1 0

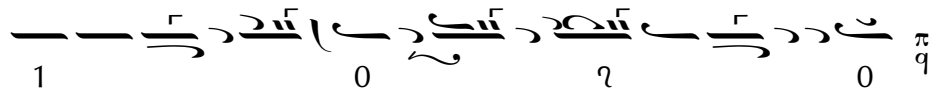
0 $\frac{\pi}{q}$

00100100 $\frac{\pi}{q}$ 0 0 1 0

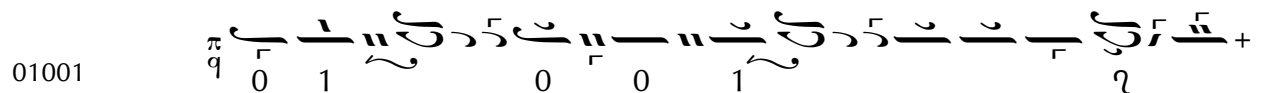
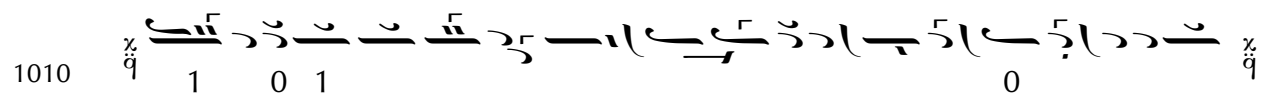
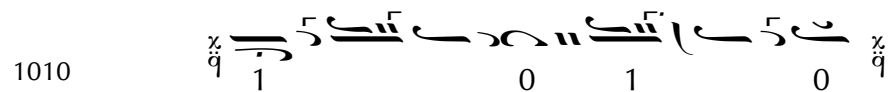
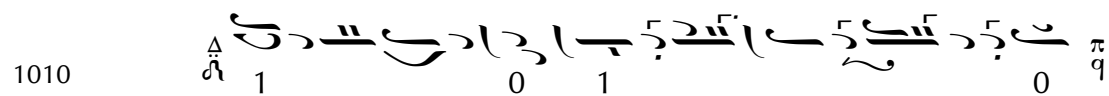
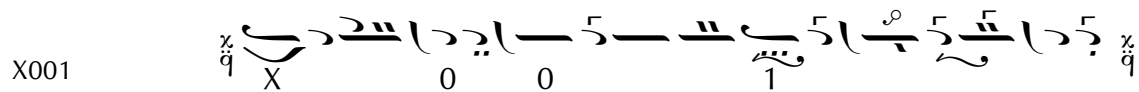
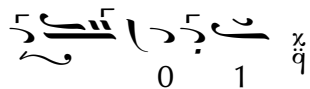
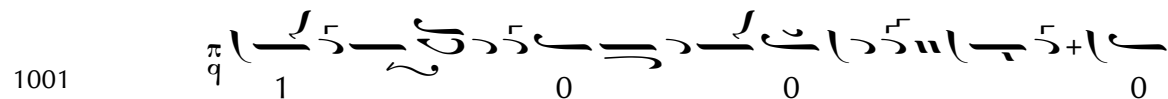
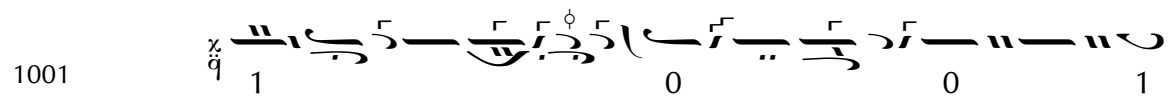
0 1 0 0 $\frac{\pi'}{q}$

00100100 $\frac{\pi}{q}$ 0 0 1 0 0

Plagal First Mode - Sticheric



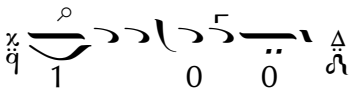
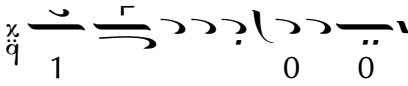


Accented on fourth to last syllable:




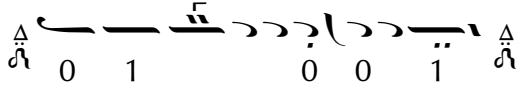
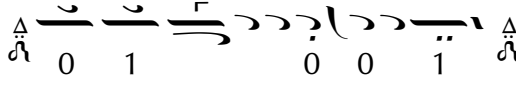


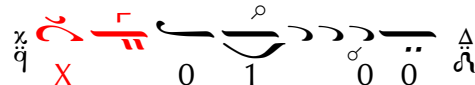

O) Final Cadences

This section was organized by number of syllables rather than by accentuation, since this is the aspect that determines the formulae. Since only three instances of final cadences accentuated on the second to last syllable were found in the books consulted, these have been highlighted.

Three syllables:

100	
100	
X0X	
	

Five syllables:

00010	
01001	
	
10001	
	
X0100	
	

Plagal First Mode - Sticheric

X0101

X

X 0

10X0X

$$\frac{z}{q} \quad 1 \quad 0 \quad X \quad 0 \quad \bar{X} \quad \Delta$$
$$\begin{array}{c} \text{0} \quad \text{X} \\ \text{0} \quad \text{X} \end{array}$$

XOXOX



$$X \quad \quad \quad 0 \quad \bar{X}$$

Six syllables:

000010

$$\frac{x}{q} \quad \overbrace{\quad}^{\quad} \quad \overbrace{\quad}^{\quad} \quad \overbrace{\quad}^{\quad} \quad \overbrace{\quad}^{\quad} \quad \underbrace{\quad}_{1} \quad \overbrace{\quad}^{\quad} \quad \overbrace{\quad}^{\quad} \quad \overbrace{\quad}^{\quad} \quad \overbrace{\quad}^{\quad} \quad \overbrace{\quad}^{\Delta} \quad \overbrace{\quad}^{\Delta}$$

000100

$\frac{x}{q} \quad \frac{0}{0} \quad \frac{0}{0} \quad \frac{1}{0} \quad \frac{1}{1} \quad \frac{0}{0} \quad \frac{0}{0} \quad \frac{\Delta}{\delta}$

0

000100

0

100001

$\frac{x}{q}$

 1 0 0 0 0

 1
 $\frac{\Delta}{\Delta}$

1

Seven syllables:

1000010

$\frac{x}{q} \frac{\rho}{\rho} \frac{1}{1} \frac{0}{0} \frac{0}{0} \frac{0}{0} \frac{0}{0} \frac{1}{1} \frac{1}{1} \frac{0}{0} \frac{\Delta}{\Delta}$

$$\begin{array}{cccccccc} \Delta & & & & & & & \Delta \\ \mathfrak{A} & & & & & & & \mathfrak{A} \\ \hline & 1 & 0 & 0 & 0 & 0 & 1 & 0 \end{array}$$

Plagal First Mode - Sticheraric

00X0X0X

X

0 X

10X0X0X

X

0 X

1010X0X

0 X

Eight syllables:

00010100

00100100

0

00101100

0

10010100

10100100

Plagal First Mode - Sticheraric

0

10101100 1 0 1 0 1 1 0 0

0

Nine syllables:

101000X0X 1 0 1 0 0 0 X 0 X

0 X

000100X0X 0 0 0 1 0 0 X 0 X

0 X

010100100 0 1 0 1 0 1 0 0

0

010101100 0 1 0 1 0 1 0 0

0

001000X0X 0 0 1 0 0 0 X 0 X

0 X

100100X0X 1 0 0 1 0 X 0 X

0

0 X

Plagal First Mode - Sticheraric

Ten syllables:

0001000X0X	$\frac{x}{q}$	

P) Final Cadences for Theotokia

010

$\frac{A}{8} \frac{\overline{0}}{0} \frac{\overline{1}}{1} \frac{\overline{7}}{7} \frac{\overline{6}}{6} \frac{\overline{5}}{5} \frac{\overline{4}}{4} \frac{\overline{3}}{3} \frac{\overline{2}}{2} \frac{\overline{1}}{1} \frac{\overline{0}}{0} \frac{\pi}{9}$

כ

1000101

$\overset{\Delta}{\underset{\Delta}{d}}$
 π_q

BYZANTINE MUSIC FORMULAE

Plagal First Mode - Heirmologic

Contents^{*}

A) Medial Cadences on Ke	466
B) Medial Cadences on High Nee.....	479
C) Formula with Fthoras	495
D) Final Cadences	497
E) Cadences for Theotokia	500

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

^{*} The Byzantine music formulae herein were extracted from all the heirmologic melodies found in the Zoe Anastasimatarion (14th edition, 2002).

A) Medial Cadences on Ke

Accented on last syllable:

From Ke

$$00 \qquad \overset{x}{\underset{\ddot{q}}{\curvearrowright}} \overset{x}{\underset{\ddot{q}}{\curvearrowright}} \overset{x}{\underset{\ddot{q}}{\curvearrowright}}$$
$$000 \quad x_{\bar{q}}^{\gamma} \overbrace{0 \quad 0 \quad 0}^{x_{\bar{q}}^{\gamma}}$$
$$\begin{array}{ccccccc} x & & & & & & x \\ \ddot{q} & & & & & & \ddot{q} \\ & \frown & \smile & \text{---} & & & \\ & 0 & 0 & 0 & & & \end{array}$$
$$0000 \quad \overbrace{0 \quad 0 \quad 0 \quad 0}^{x \cdot \bar{q} \quad x \cdot \bar{q} \quad x \cdot \bar{q} \quad x \cdot \bar{q}}$$
$$00000 \quad \overset{\times}{q} \quad \overset{\times}{q} \quad \overset{\times}{q} \quad \overset{\times}{q} \quad \overset{\times}{q} \quad \overset{\times}{q}$$

10001

$\begin{array}{c} \text{1} \\ \text{0} \\ \text{0} \\ \text{0} \\ \text{1} \end{array}$

$$\begin{array}{ccccccc} \text{X} & & & & & & \text{X} \\ \text{q} & \text{---} & \text{---} & \text{---} & \text{---} & & \text{q} \\ & 1 & 0 & 0 & 0 & 1 & \end{array}$$
$$100001 \quad \begin{array}{c} \overbrace{1 \ 0 \ 0 \ 0 \ 0}^{x \ q} \quad \overbrace{1}^{x \ q} \end{array}$$

From Nee

$$00 \quad \begin{array}{c} \gamma' \\ n \end{array} \begin{array}{c} \hookrightarrow \\ 0 \end{array} \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} x \\ q \end{array}$$
$$00001 \quad \begin{array}{ccccc} \gamma' & \curvearrowright & \text{---} & \curvearrowleft & \curvearrowright \\ \eta & 0 & 0 & 0 & 1 \\ & & & & \tilde{q} \end{array}$$

010001

γ'
 α
 β
 γ
 δ
 ϵ
 ζ
 η
 θ
 ι
 κ
 λ
 μ
 ν
 ξ
 \omicron
 π
 ρ
 σ
 τ
 υ
 ϕ
 χ
 ψ
 ω
 α
 β
 γ
 δ
 ϵ
 ζ
 η
 θ
 ι
 κ
 λ
 μ
 ν
 ξ
 \omicron
 π
 ρ
 σ
 τ
 υ
 ϕ
 χ
 ψ
 ω

0010001

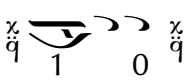

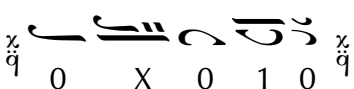
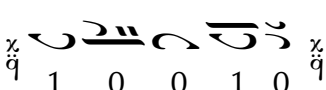
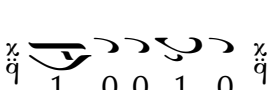
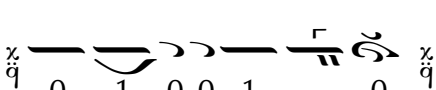
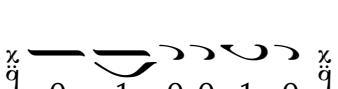
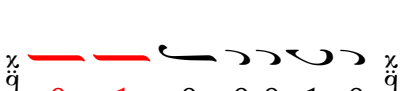

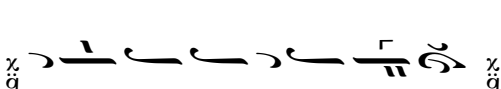


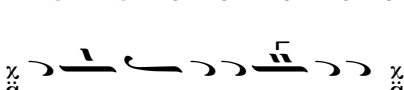
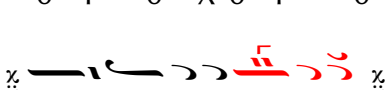


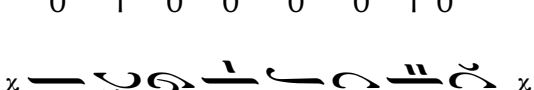
γ'

0 0 1 0 0 0 1

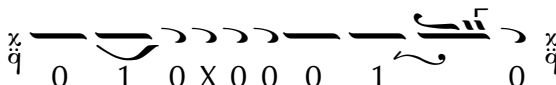
x_q

1 0

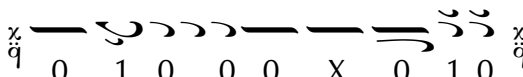
Plagal First Mode - Heirmologic

		
X010		
0X010		
10010		
		
010010		
		
0100010		
		
		
010X010		
1000010		
01000010		
01010010		

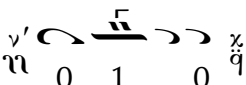
Plagal First Mode - Heirmologic

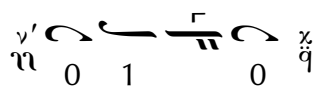
010X00010 

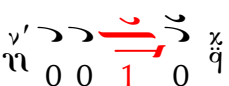
010000010 

01000X010 

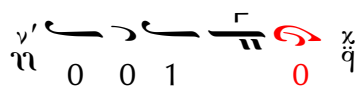
From Nee

010 

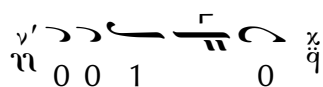


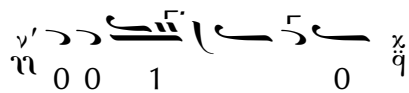
0010 

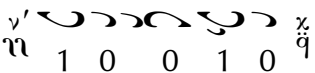









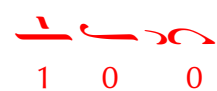


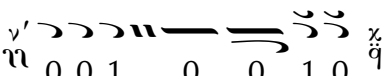
10010 

010010 







0010010 

Plagal First Mode - Heirmologic

[illegible]

Plagal First Mode - Heirmologic

010X00010	$\overset{\gamma'}{\underset{\text{u}}{\text{u}}} \text{u} \text{u} \text{—} \text{—} \text{u} \text{u} \overset{\text{x}}{\underset{\text{q}}{\text{q}}}$ 0 1 0 X 0 0 0 1 0
010010010	$\overset{\gamma'}{\underset{\text{u}}{\text{u}}} \text{u} \text{u} \text{u} \text{u} \text{—} \text{—} \text{u} \text{u} \text{u} \overset{\text{x}}{\underset{\text{q}}{\text{q}}}$ 0 1 0 0 1 0 0 1 0
100000110	$\overset{\gamma'}{\underset{\text{u}}{\text{u}}} \text{u} \text{u} \text{—} \text{u} \text{u} \text{—} \text{—} \text{u} \text{u} \text{u} \overset{\text{x}}{\underset{\text{q}}{\text{q}}}$ 1 0 0 0 0 0 0 1 1 0
100100010	$\overset{\gamma'}{\underset{\text{u}}{\text{u}}} \text{u} \text{u} \text{—} \text{—} \text{u} \text{u} \text{u} \text{u} \text{u} \overset{\text{x}}{\underset{\text{q}}{\text{q}}}$ 1 0 0 1 0 0 0 1 0
0100X00010	$\overset{\gamma'}{\underset{\text{u}}{\text{u}}} \text{u} \text{u} \text{u} \text{u} \text{—} \text{—} \text{u} \text{u} \text{u} \overset{\text{x}}{\underset{\text{q}}{\text{q}}}$ 0 1 0 0 X 0 0 0 1 0
	$\overset{\gamma'}{\underset{\text{u}}{\text{u}}} \text{u} \text{u} \text{u} \text{u} \text{—} \text{—} \text{u} \text{u} \text{u} \text{u} \overset{\text{x}}{\underset{\text{q}}{\text{q}}}$ 0 1 0 0 1 0 0 0 1 0
01000100010	$\overset{\gamma'}{\underset{\text{u}}{\text{u}}} \text{—} \text{—} \text{u} \text{u} \text{u} \text{u} \text{—} \text{—} \text{u} \text{u} \text{u} \text{u} \overset{\text{x}}{\underset{\text{q}}{\text{q}}}$ 0 1 0 0 0 1 0 0 0 1 0
10100X0X010	$\overset{\gamma'}{\underset{\text{u}}{\text{u}}} \text{u} \text{u} \text{u} \text{u} \text{u} \text{u} \text{—} \text{—} \text{u} \text{u} \text{u} \overset{\text{x}}{\underset{\text{q}}{\text{q}}}$ 1 0 1 0 0 X 0 X 0 1 0

Accented on third to last syllable:

From Ke

100	$\overset{\text{x}}{\underset{\text{q}}{\text{q}}} \text{u} \text{—} \overset{\text{x}}{\underset{\text{q}}{\text{q}}}$ 1 0 0
	$\overset{\text{x}}{\underset{\text{q}}{\text{q}}} \text{u} \text{u} \overset{\text{x}}{\underset{\text{q}}{\text{q}}}$ 1 0 0
	$\overset{\text{x}}{\underset{\text{q}}{\text{q}}} \text{u} \text{u} \overset{\text{x}}{\underset{\text{q}}{\text{q}}}$ 1 0 0
	$\overset{\text{x}}{\underset{\text{q}}{\text{q}}} \text{u} \text{u} \overset{\text{x}}{\underset{\text{q}}{\text{q}}}$ 1 0 0

1

Plagal First Mode - Heirmologic

$$\begin{array}{c} \text{\tiny χ} \\ \ddot{q} \end{array} \quad \begin{array}{ccc} \cup & \cap & - \\ 1 & 0 & 0 \end{array} \quad \begin{array}{c} \text{\tiny χ} \\ \ddot{q} \end{array}$$$
[illegible]

1 0

$$\begin{array}{ccccccc} x & \overline{\quad} & \overline{\quad} & \overline{\quad} & \overline{\quad} & x \\ \ddot{q} & 0 & 1 & 0 & 0 & \ddot{q} \end{array}$$
$$\begin{array}{ccccccccc} \text{1} & \text{0} & \text{1} & \text{0} & \text{0} \\ \text{1} & \text{0} & \text{1} & \text{0} & \text{0} \end{array}$$
[illegible]
$$\begin{array}{ccccccccc} \text{\tiny \mathbb{Z}} & \text{\tiny \bar{q}} & \text{\tiny \bar{q}} & \text{\tiny \bar{q}} & \text{\tiny \bar{q}} & \text{\tiny \bar{q}} & \text{\tiny \bar{q}} & \text{\tiny \bar{q}} & \text{\tiny \bar{q}} \\ \hline & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 \end{array}$$
$$\begin{array}{ccccccc} \begin{array}{c} \text{X} \\ \ddot{\text{q}} \end{array} & \begin{array}{c} \text{X} \\ \ddot{\text{q}} \end{array} & \begin{array}{c} \text{X} \\ \ddot{\text{q}} \end{array} & \begin{array}{c} \text{X} \\ \ddot{\text{q}} \end{array} & \begin{array}{c} \text{X} \\ \ddot{\text{q}} \end{array} & \begin{array}{c} \text{X} \\ \ddot{\text{q}} \end{array} & \begin{array}{c} \text{X} \\ \ddot{\text{q}} \end{array} \\ 1 & 0 & 0 & 1 & 0 & 0 & 0 \end{array}$$
$$\begin{array}{ccccccc} \mathbb{Z} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \mathbb{Z} \\ \ddot{q} & 1 & 0 & 0 & 1 & 0 & 0 \\ \ddot{q} & & & & & & \ddot{q} \end{array}$$
$$\begin{array}{cccccc} \text{1} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} \\ \text{1} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} \end{array}$$
$$\begin{array}{ccccccc} \text{\textcircled{\tiny x}} & \text{\textcircled{\tiny x}} & \text{\textcircled{\tiny x}} & \text{\textcircled{\tiny x}} & \text{\textcircled{\tiny x}} & \text{\textcircled{\tiny x}} & \text{\textcircled{\tiny x}} \\ \text{\textcircled{\tiny q}} & \text{\textcircled{\tiny q}} & \text{\textcircled{\tiny q}} & \text{\textcircled{\tiny q}} & \text{\textcircled{\tiny q}} & \text{\textcircled{\tiny q}} & \text{\textcircled{\tiny q}} \\ 1 & 0 & 0 & 1 & 0 & 0 & \end{array}$$
[illegible]
$$\begin{array}{ccccccc} \text{⌘} & \text{—} & \text{⌘} & \text{⌘} & \text{—} & \text{⌘} & \text{⌘} \\ \text{q} & & \text{1} & \text{0 0} & & \text{1} & \text{0 0} \\ & \text{0} & & & & & \end{array}$$
$$\begin{array}{ccccccc} \frac{x}{q} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \frac{x}{q} \\ 0 & 1 & 0 & 0 & 1 & 0 & 0 \end{array}$$

$\frac{x}{q}$
 $\frac{x}{q}$

Plagal First Mode - Heirmologic

1000100

10100100

010010100

100100100

From Nee

0100

00100

10100

100100

0010100

Plagal First Mode - Heirmologic

0100100

0100X0X

X0X0100

0100100

$$\overset{\gamma'}{\mathfrak{u}} \overset{\sim}{\underset{0}{\curvearrowright}} \overset{\sim}{\underset{1}{\curvearrowright}} \overset{\sim}{\underset{0}{\curvearrowright}} \overset{\sim}{\underset{0}{\curvearrowright}} \overset{\sim}{\underset{1}{\curvearrowright}} \overset{\sim}{\underset{0}{\curvearrowright}} \overset{\sim}{\underset{0}{\curvearrowright}} \overset{\sim}{\underset{0}{\curvearrowright}} \overset{\sim}{\underset{0}{\curvearrowright}}$$

10X0100

00100100

1

1

1

[illegible]

01000100

1 0

$$\begin{array}{cccccccc} \gamma' & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \gamma \\ \eta & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 0 & \xi \\ & & & & & & & & & \eta \end{array}$$

01010100

Plagal First Mode - Heirmologic

[illegible]

Plagal First Mode - Heirmologic

0100100100

1000100100

01000100100

Accented on fourth to last syllable:

From Ke

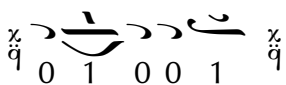
1000

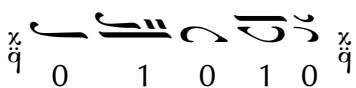
1001

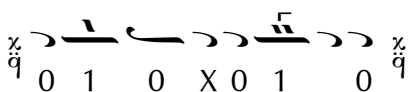
1010

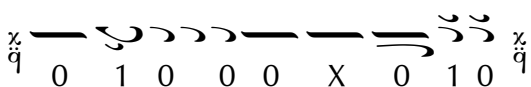
01000

Plagal First Mode - Heirmologic

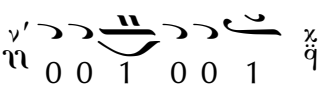
01001 

01010 

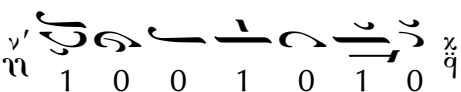
010X010 

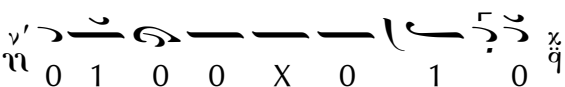
01000X010 

From Nee

001001 

1001000 

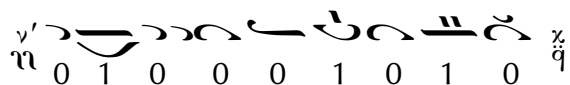
1001010 

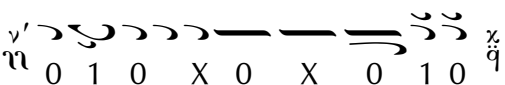
0100X010 

01001001 

10001001 

010001010 



010X0X010 

Plagal First Mode - Heirmologic

0100001010 $\begin{matrix} \gamma' \\ n \end{matrix} \begin{matrix} \nearrow & \searrow & \nearrow & \searrow & \nearrow & \searrow & \nearrow & \searrow \\ 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 \end{matrix} \begin{matrix} \nearrow & \searrow \\ x & q \end{matrix}$

$$\begin{array}{cccccccccc} \gamma' & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright \\ \eta & 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 \end{array} \quad \begin{array}{c} x \\ q \end{array}$$

010X001010

γ'
 χ_q

0 1 0 X 0 0 1 0 1 0

10100X0X010

$\overset{y'}{u}$
 $\overset{z}{q}$

1 0 1 0 0 X 0 X 0 1 0

B) Medial Cadences on High Nee

Accented on last syllable:

From Ke

$$0 \leq \frac{x}{q} \leq \frac{q'}{n}$$
$$00 \quad \overset{x}{q} \overset{\curvearrowright}{\overline{0}} \overset{y'}{n}$$
$$01 \quad \overset{x}{\underset{\ddot{q}}{\curvearrowright}} \quad \overset{y'}{\underset{n}{\curvearrowright}} \quad \overset{0}{\curvearrowright} \quad \overset{1}{\curvearrowright}$$
$$\begin{array}{ccc} x & \text{---} & y' \\ \ddot{q} & & n \\ 0 & 1 & \end{array}$$
$$\begin{array}{ccccc} x & & 1 & & y' \\ \ddot{q} & \rightarrow & \frac{}{} & \rightarrow & u \\ 0 & & 1 & & n \end{array}$$

0001

$\frac{x}{q}$ 0 0 0 1 $\frac{y'}{n}$

1

10001

$\frac{x}{q}$ 1 0 0 0 1 $\frac{x'}{q'}$

1 0 1

1

$$\begin{array}{ccccccccc} \overset{x}{\underset{\bar{q}}{\curvearrowright}} & \curvearrowright & \curvearrowright & \curvearrowright & \overset{y'}{\underset{n}{\curvearrowright}} \\ & 1 & 0 & 0 & 0 & 1 & & & \end{array}$$

100001

$\frac{5}{q}$ 1 0 0 0 0 1 $\frac{r'}{n}$

[illegible]

1

Plagal First Mode - Heirmologic

[illegible]

From Nee

01

001

0001

1

1

1

Plagal First Mode - Heirmologic

00001 ṽ' 0 0 0 0 1 ṽ'

10001 ṽ' 1 0 0 0 1 ṽ'

000001 ṽ' 0 0 0 0 0 1 ṽ'

010001 ṽ' 0 1 0 0 0 1 ṽ'

010X01 ṽ' 0 1 0 X 0 1 ṽ'

100001 ṽ' 1 0 0 0 0 1 ṽ'

110001 ṽ' 1 1 0 0 0 1 ṽ'

0100001 ṽ' 0 1 0 0 0 0 1 ṽ'

ṽ' 0 1 0 0 0 0 1 ṽ'

010000001 ṽ' 0 1 0 0 0 0 0 0 1 ṽ'

1

1

1

Accented on second to last syllable:

From Ke

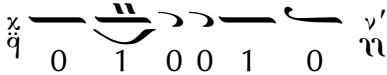
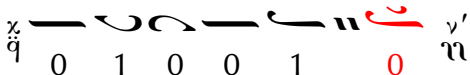

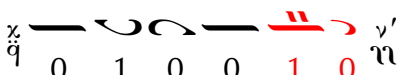

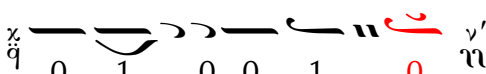

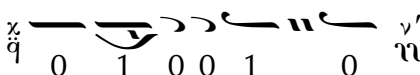
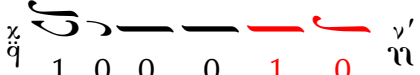

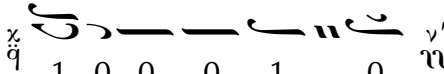
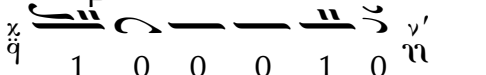
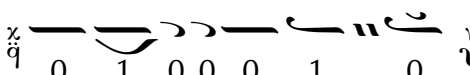
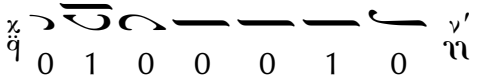

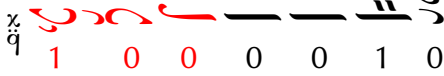

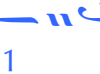


10 ṽ' 1 0 ṽ'

ṽ' 1 0 ṽ'

Plagal First Mode - Heirmologic

[illegible]

Plagal First Mode - Heirmologic

010010		
		
		
		
100010		
		
		
0100010		
		
1000010		
100X010		
		
		

Plagal First Mode - Heirmologic

$$\begin{array}{ccccccc} \frac{x}{q} & \text{---} & \overbrace{\quad\quad}^{\parallel} & \curvearrowright & \curvearrowright & \text{---} & \underbrace{\quad\quad}_{\parallel} \\ 0 & & 1 & 0 & 0 & 0 & 1 \\ & & & & & & 0 \end{array} \quad \begin{array}{c} y' \\ n \end{array}$$

$$\begin{array}{cccccccc} \frac{x}{q} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \frac{y'}{n} \\ & 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 \end{array}$$
$$\begin{array}{cccccccc} \frac{x}{q} & \frac{1}{1} & \frac{1}{0} & \frac{1}{0} & \frac{1}{1} & \frac{1}{0} & \frac{1}{0} & \frac{1}{1} & \frac{1}{0} & \frac{y'}{n} \end{array}$$
[illegible]
$$\begin{array}{cccccccc} \frac{x}{q} & \frac{1}{2} & \frac{1}{3} & \frac{1}{4} & \frac{1}{5} & \frac{1}{6} & \frac{1}{7} & \frac{1}{8} & \frac{y}{n} \\ 1 & 0 & 0 & 1 & 0 & 0 & 1 & 0 \end{array}$$
$$\begin{array}{cccccccccccc} \text{1} & \text{0} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} & \text{1} & \text{7} & \text{2} & \text{9} & \text{1} \\ \text{1} & \text{0} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} & \text{1} & \text{7} & \text{2} & \text{9} & \text{1} \end{array}$$

From Nee

$$\begin{array}{ccccc} \nu' & \hookrightarrow & \nu' & & \\ \mathfrak{n} & 1 & 0 & \mathfrak{n} & \end{array}$$
$$\mathfrak{u}^{\vee} \begin{array}{c} \text{---} \text{---} \text{---} \\ \text{---} \text{---} \end{array} \mathfrak{u}^{\vee} \begin{array}{c} \text{---} \text{---} \text{---} \\ \text{---} \text{---} \end{array}$$

$$\begin{array}{c} \gamma' \\ n \end{array} \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \text{---} \\ 1 \end{array} \begin{array}{c} \text{---} \\ 5 \end{array} \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \gamma' \\ n \end{array}$$
$$\begin{array}{ccccccc} \gamma' & & \downarrow & & \gamma' \\ \eta & \hookrightarrow & 0 & \xrightarrow{\quad} & 1 & \xrightarrow{\quad} & 0 & \xrightarrow{\quad} & \eta \end{array}$$
$$\begin{array}{ccccccc} \gamma' & \text{---} & \text{---} & \text{---} & \text{---} & \gamma' \\ \mathfrak{n} & 0 & 0 & 1 & 0 & \mathfrak{n} \end{array}$$
$$\begin{array}{ccccccc} \gamma' & \frown & \text{---} & \text{---} & \text{---} & \smile & \gamma' \\ \mathfrak{n} & & 0 & 0 & 1 & 0 & \mathfrak{n} \end{array}$$

$$\begin{array}{ccccccc} \gamma' & \curvearrowright & \text{---} & \text{---} & \text{---} & \text{---} & \gamma' \\ n & 0 & 0 & 1 & 0 & n \end{array}$$

Plagal First Mode - Heirmologic

	$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$ 0 0 1 0	
0X010	$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$ 0 X 0 1 0	
00010	$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$ 0 0 0 1 0	
	$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$ 0 0 0 1 0	$\text{---} \text{---}$ 1 0
	$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$ 0 0 0 1 0	
	$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$ 0 0 0 1 0	
10010	$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$ 1 0 0 1 0	
	$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$ 1 0 0 1 0	
	$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$ 1 0 1 0	
	$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$ 1 0 1 0	
	$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$ 1 0 1 0	
	$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$ 1 0 1 0	
000010	$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$ 0 0 0 0 1 0	
	$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$ 0 0 0 0 1 0	
010010	$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$ 0 1 0 0 1 0	

Plagal First Mode - Heirmologic

$$\begin{array}{ccccccc} \gamma' & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \gamma' \\ \mathfrak{U} & 0 & 1 & 0 & 0 & 1 & 0 & \mathfrak{U} \end{array}$$
$$\begin{array}{ccccccc} \gamma' & & \gamma & & & & \gamma' \\ \eta & \rightarrow & \text{red } \eta & \rightarrow & \eta & \rightarrow & \eta \\ 0 & & 1 & & 0 & & 0 & & 1 & & 0 \end{array}$$

1

$$\begin{array}{ccccccccc} \gamma' & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \gamma' \\ \mathfrak{N} & 0 & 1 & 0 & 0 & 1 & 0 & \mathfrak{N} \end{array}$$
$$\begin{array}{ccccccc} \gamma' & & \bar{5} & & & & \gamma' \\ \eta & \text{---} & \eta & \text{---} & \eta & \text{---} & \eta \\ & 0 & 1 & & 0 & 0 & 1 & 0 \end{array}$$
$$\begin{array}{ccccccc} \gamma' & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \gamma' \\ \eta & 0 & 1 & 0 & 0 & 1 & 0 \\ & & & & & & \eta \end{array}$$
$$\begin{array}{ccccccc} \gamma' & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \gamma' \\ \text{u} & 1 & 0 & 0 & 0 & 1 & 0 & \text{u} \end{array}$$
$$\begin{array}{ccccccc} \gamma' & \curvearrowright & \curvearrowright & \text{---} & \text{---} & \underbrace{\hspace{1cm}} & \curvearrowright \gamma' \\ \mathfrak{N} & 1 & 0 & 0 & 0 & 1 & 0 \\ & & & & & & \mathfrak{N} \end{array}$$
$$\overset{\gamma'}{u} \underbrace{\quad}_{1} \underbrace{\quad}_{0} X \underbrace{\quad}_{0} \underbrace{\quad}_{1} \underbrace{\quad}_{0} \overset{\gamma'}{u}$$
$$\begin{array}{ccccccc} \gamma' & \cup & \overline{\cup} & \cup & \cup & \overline{\cup} & \gamma' \\ n & 1 & 1 & 0 & 0 & 1 & n \end{array}$$
$$\begin{array}{ccccccccccc} \gamma' & \text{hook} & \text{hook} & \text{hook} & \text{hook} & \text{hook} & \text{hook} & \text{hook} & \gamma' \\ \eta & 0 & 0 & 0 & X & 0 & 1 & 0 & \eta \end{array}$$
$$\begin{array}{ccccccc} \gamma' & \curvearrowright & \curvearrowright & \text{---} & \text{---} & \text{---} & \gamma' \\ \mathfrak{U} & 0 & 1 & 0 & X & 0 & 1 & 0 & \mathfrak{U} \end{array}$$
$$\begin{array}{ccccccc} \gamma' & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \gamma' \\ \mathfrak{N} & 0 & 1 & 0 & \times & 0 & 1 & 0 & \mathfrak{N} \end{array}$$
$$\begin{array}{ccccccccccc} \gamma' & \text{hook} & \text{hook} & \text{hook} & \text{hook} & \text{hook} & \text{hook} & \text{hook} & \text{hook} & \gamma' \\ \mathfrak{h} & 1 & 0 & 0 & 0 & 0 & 1 & 0 & \mathfrak{h} \end{array}$$
$$\begin{array}{ccccccccccc} \gamma' & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \gamma' \\ \mathfrak{A} & 0 & 1 & \sim & 0 & 0 & 0 & 0 & 1 & 0 & \mathfrak{A} \end{array}$$

Plagal First Mode - Heirmologic

01X00010

01100010

10010010

0001000010

Accented on third to last syllable:

From Ke

[illegible]

0 1

Plagal First Mode - Heirmologic

$$\begin{array}{ccccccc} \chi & \text{---} & \cup & \supset & \supset & & \chi' \\ \ddot{q} & & & & & & \ddot{q}' \\ & 0 & 1 & 0 & 0 & & \end{array}$$

0101

00100

$$\begin{array}{ccccccccc} \overbrace{\quad}^{\chi} & \overbrace{\quad}^{\chi} & \overbrace{\quad}^{\chi} & \overbrace{\quad}^{\chi} & \overbrace{\quad}^{\chi} & \overbrace{\quad}^{\chi} & \overbrace{\quad}^{\chi} & \overbrace{\quad}^{\chi} & \overbrace{\quad}^{\chi} \\ \underbrace{\quad}_0 & \underbrace{\quad}_0 & \underbrace{\quad}_1 & \underbrace{\quad}_0 & \underbrace{\quad}_0 & \underbrace{\quad}_0 & \underbrace{\quad}_0 & \underbrace{\quad}_0 & \underbrace{\quad}_0 \end{array}$$

000100

100100

$$\begin{array}{ccccccc} \text{z} & \text{y} & \text{r} & \text{—} & \text{r} & \text{r} & \text{y}' \\ \text{q} & & & & & & \text{u} \\ & 1 & 0 & 0 & 1 & 0 & 0 \end{array}$$
$$\begin{array}{ccccccc} \text{1} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} & \text{1} \\ \text{1} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} & \text{1} \end{array}$$

0100100

1000100

01000100

10000100

$$\begin{array}{ccccccc} \text{5} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{5} \\ \text{1} & \text{0} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} \end{array}$$

010000100



Plagal First Mode - Heirmologic

$\frac{x}{q}$ — $\frac{u}{1}$ \curvearrowright \curvearrowright — $\overline{0}$ \curvearrowright $\frac{u}{0}$ $\frac{v'}{u}$
 0 1 0 0 0 0 1 0 0

010010100

$\frac{x}{q}$ — $\frac{u}{1}$ \curvearrowright \curvearrowright \curvearrowright — \curvearrowright $\frac{u}{0}$ $\frac{v'}{u}$
 0 1 0 0 1 0 1 0 0

100100100

$\frac{x}{q}$ $\frac{u}{1}$ \curvearrowright $\frac{u}{0}$ $\frac{u}{0}$ $\frac{u}{1}$ — — $\frac{u}{0}$ $\frac{u}{0}$ $\frac{v'}{u}$
 1 0 0 1 0 0 1 0 0

From Nee

100

$\frac{v'}{u}$ \curvearrowright $\frac{u}{1}$ $\frac{u}{0}$ $\frac{v'}{u}$
 1 0 0

$\frac{v'}{u}$ \curvearrowright $\frac{u}{1}$ $\frac{u}{0}$ $\frac{v'}{u}$
 1 0 0

$\frac{v'}{u}$ $\frac{u}{1}$ $\frac{u}{0}$ $\frac{v'}{u}$
 1 0 0

$\frac{v'}{u}$ $\frac{u}{1}$ $\frac{u}{0}$ $\frac{v'}{u}$
 1 0 0

$\frac{v'}{u}$ — $\frac{u}{1}$ $\frac{u}{0}$ $\frac{v'}{u}$
 1 0 0

0100

$\frac{v'}{u}$ $\frac{u}{0}$ $\frac{u}{1}$ $\frac{u}{0}$ $\frac{v'}{u}$
 0 1 0 0

$\frac{v'}{u}$ — $\frac{u}{0}$ $\frac{u}{1}$ $\frac{u}{0}$ $\frac{v'}{u}$
 0 1 0 0

$\frac{u}{1}$
 1

$\frac{u}{1}$
 1

010X

$\frac{v'}{u}$ $\frac{u}{0}$ $\frac{u}{1}$ $\frac{u}{0}$ $\frac{v'}{u}$
 0 1 0 X

$\frac{u}{0}$
 0

$\frac{u}{0}$ $\frac{u}{1}$
 0 1

Plagal First Mode - Heirmologic

00101 $\overset{\gamma'}{\text{u}} \text{---} \overline{\text{u}} \text{---} \text{u} \text{---} \overset{\gamma'}{\text{u}}$
 0 0 1 0 1

$\overset{\gamma'}{\text{u}} \text{---} \text{u} \text{---} \overline{\text{u}} \text{---} \overset{\gamma'}{\text{u}}$
 0 0 1 0 1

000100 $\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$
 0 0 0 1 0 0

$\overset{\gamma'}{\text{u}} \overline{\text{u}} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$
 0 0 0 1 0 0

010100 $\overset{\gamma'}{\text{u}} \overline{\text{u}} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$
 0 1 0 1 0 0

100100 $\overset{\gamma'}{\text{u}} \overline{\text{u}} \text{---} \text{---} \overline{\text{u}} \text{---} \text{---} \overset{\gamma'}{\text{u}}$
 1 0 0 1 0 0

$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$
 1 0 0 1 0 0

$\overline{\text{u}} \text{---}$
 1 0

0000100 $\overset{\gamma'}{\text{u}} \overline{\text{u}} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$
 0 0 0 0 1 0 0

0100100 $\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$
 0 1 0 0 1 0 0

$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$
 0 1 0 0 1 0 0

$\text{---} \text{---}$
 1 0

$\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$
 0 1 0 0 1 0 0

0100101 $\overset{\gamma'}{\text{u}} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{\gamma'}{\text{u}}$
 0 1 0 0 1 0 1

1000100 $\overset{\gamma'}{\text{u}} \overline{\text{u}} \text{---} \text{---} \overline{\text{u}} \text{---} \text{---} \overset{\gamma'}{\text{u}}$
 1 0 0 0 1 0 0

Plagal First Mode - Heirmologic

00010100 γ' 0 0 0 1 0 1 0 0 γ'

01000100 γ' 0 1 0 0 0 1 0 0 γ'

01100100 γ' 0 1 1 0 0 1 0 0 γ'

000100100 γ' 0 0 0 1 0 0 1 0 0 γ'

Accented on fourth to last syllable:

From Ke

1001	$\begin{array}{ccccccc} \text{q} & \text{p} & \text{r} & \text{s} & \text{t} & \text{u} & \text{v} \\ \text{1} & \text{0} & \text{0} & \text{1} & & & \end{array}$	1
	$\begin{array}{ccccccc} \text{q} & \text{p} & \text{r} & \text{s} & \text{t} & \text{u} & \text{v} \\ \text{1} & \text{0} & \text{0} & & \text{1} & & \end{array}$	
	$\begin{array}{ccccccc} \text{q} & \text{p} & \text{r} & \text{s} & \text{t} & \text{u} & \text{v} \\ \text{1} & \text{0} & \text{0} & & \text{1} & & \end{array}$	
1010	$\begin{array}{ccccccc} \text{q} & \text{p} & \text{r} & \text{s} & \text{t} & \text{u} & \text{v} \\ \text{1} & \text{0} & \text{1} & \text{0} & & & \end{array}$	
01001	$\begin{array}{ccccccc} \text{q} & \text{p} & \text{r} & \text{s} & \text{t} & \text{u} & \text{v} \\ \text{0} & \text{1} & \text{0} & \text{0} & \text{1} & & \end{array}$	1
	$\begin{array}{ccccccc} \text{q} & \text{p} & \text{r} & \text{s} & \text{t} & \text{u} & \text{v} \\ \text{0} & \text{1} & & \text{0} & \text{0} & \text{1} & \end{array}$	1
	$\begin{array}{ccccccc} \text{q} & \text{p} & \text{r} & \text{s} & \text{t} & \text{u} & \text{v} \\ \text{0} & \text{1} & \text{0} & \text{0} & \text{1} & & \end{array}$	
	$\begin{array}{ccccccc} \text{q} & \text{p} & \text{r} & \text{s} & \text{t} & \text{u} & \text{v} \\ \text{0} & \text{1} & \text{0} & \text{0} & \text{1} & & \end{array}$	

Plagal First Mode - Heirmologic

$$\frac{x}{q} \overline{\quad} \underbrace{\quad}_{0 \quad 1 \quad 0} \overline{\quad} \frac{y'}{n}$$

1 0

01010

$$\begin{array}{ccccccccc} \mathbf{x} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \mathbf{y}' \\ \mathbf{q} & 0 & 1 & 0 & 1 & & & & 0 & n \end{array}$$
$$\begin{array}{ccccccccc} x & & & & & & & & y' \\ \ddot{q} & \curvearrowright & \curvearrowleft & \curvearrowright & \text{---} & \curvearrowleft & & & n \\ & 0 & 1 & 0 & 1 & 0 & & & \end{array}$$

00X010

$$\begin{array}{ccccccc} \chi & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \chi' \\ \bar{q} & 0 & 0 & X & 0 & 1 & 0 \\ & & & & & & n \end{array}$$

0101001

$$\begin{array}{ccccccc} \overline{\overline{0}} & \overline{1} & \overline{0} & \overline{1} & \overline{0} & \overline{0} & \overline{1} \\ 0 & 1 & 0 & 1 & 0 & 0 & 1 \end{array} \quad \begin{array}{l} \gamma \\ \eta \end{array}$$

1001010

$$\begin{array}{ccccccc} \text{1} & \text{0} & \text{0} & \text{1} & \text{0} & \text{1} & \text{0} \\ \text{1} & \text{0} & \text{0} & \text{1} & \text{0} & \text{1} & \text{0} \end{array}$$

10001001

$$\begin{array}{cccccccc} \text{1} & \text{0} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} & \text{1} \\ \text{1} & \text{0} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} & \text{1} \end{array}$$
$$\begin{array}{ccccccc} \text{1} & \text{0} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} & \text{1} \\ \text{1} & \text{0} & \text{0} & \text{0} & \text{1} & \text{0} & \text{0} & \text{1} \end{array}$$

10001010

$$\begin{array}{cccccccc} \begin{array}{c} \text{S} \\ \text{q} \end{array} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \begin{array}{c} \text{S} \\ \text{q} \end{array} \\ 1 & 0 & 0 & 0 & 1 & 0 & 1 & 0 \end{array}$$

From Nee

1001

$$\overset{\gamma'}{\mathfrak{N}} \overset{\smile}{\underset{1}{\smile}} \overset{\smile}{\smile} \overset{\smile}{\smile} \overset{\smile}{\smile} \overset{\smile}{\smile} \overset{\gamma'}{\mathfrak{N}}$$

1

$$\frac{1}{1}$$

1

Plagal First Mode - Heirmologic

[illegible]

Plagal First Mode - Heirmologic



C) Formula with Fthoras

Accented on second to last syllable:

10010 $\overset{\times}{q} \overbrace{1 \ 0 \ 0}^{\text{—}} \overbrace{1 \ 0}^{\text{—}} \overset{\circ}{n}$

100010 $\overset{\times}{q} \overbrace{1 \ 0 \ 0 \ 0}^{\text{—}} \overbrace{1 \ 0}^{\text{—}} \overset{\circ}{n}$

Accented on third to last syllable:

00100 $\overset{\times}{q} \overbrace{0 \ 0}^{\text{—}} \overbrace{1 \ 0}^{\text{—}} \overbrace{0}^{\text{—}} \overset{\circ}{q}$

$\overset{\times}{q} \overbrace{0 \ 0}^{\text{—}} \overbrace{1 \ 0}^{\text{—}} \overbrace{0}^{\text{—}} \overset{\circ}{q}$

000100 $\overset{\times}{q} \overbrace{0 \ 0 \ 0}^{\text{—}} \overbrace{1 \ 0}^{\text{—}} \overbrace{0}^{\text{—}} \overset{\circ}{q}$

100100 $\overset{\times}{q} \overbrace{1 \ 0}^{\text{—}} \overbrace{0 \ 1}^{\text{—}} \overbrace{0 \ 0}^{\text{—}} \overset{\circ}{q}$

0100100 $\overset{\times}{q} \overbrace{0 \ 1}^{\text{—}} \overbrace{0 \ 0}^{\text{—}} \overbrace{1 \ 0}^{\text{—}} \overbrace{0}^{\text{—}} \overset{\circ}{q}$

10001100100 $\overset{\times}{q} \overbrace{1 \ 0 \ 0 \ 0}^{\text{—}} \overbrace{1 \ 0}^{\text{—}} \overbrace{0 \ 0}^{\text{—}} \overbrace{1 \ 0}^{\text{—}} \overbrace{0}^{\text{—}} \overset{\circ}{q}$

10010000100 $\overset{\times}{q} \overbrace{1 \ 0 \ 0}^{\text{—}} \overbrace{1 \ 0 \ 0}^{\text{—}} \overbrace{0 \ 0}^{\text{—}} \overbrace{0 \ 0}^{\text{—}} \overbrace{1 \ 0}^{\text{—}} \overbrace{0}^{\text{—}} \overset{\circ}{q}$

Accented on fourth to last syllable:

1000 $\overset{\times}{q} \overbrace{1 \ 0 \ 0}^{\text{—}} \overbrace{0}^{\text{—}} \overset{\circ}{q}$

Plagal First Mode - Heirmologic

01001001



D) Final Cadences

Accented on last syllable:

From Ke

010001

100001

1010001

$\frac{x}{q}$
 $\frac{x}{q}$

10X0001

10100001

$\frac{x}{q}$
 $\frac{x}{q}$

1 0 1 0 0 0 1

110X0001

Accented on second to last syllable:

From Ke

00010

$\frac{\%}{q}$ 0 0 0 1 0 $\frac{\%}{q}$


10010

$\frac{x}{q}$ 1 0 0 1 0 $\frac{x}{q}$

010010

0 1 0 0 1 0

100010

$\frac{x}{q}$  $\frac{x}{q}$

$\frac{1}{q}$ 1000010 $\frac{x}{q}$

1 0

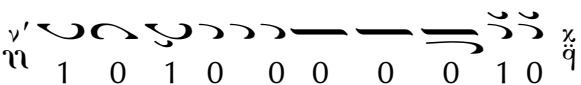
1

Plagal First Mode - Heirmologic

01000010 

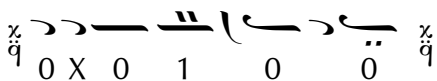
From Nee

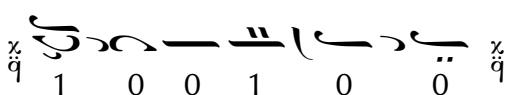
10010010 

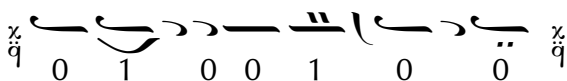
1010000010 

Accented on third to last syllable:

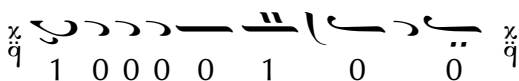
From Ke

0X0100 

100100 

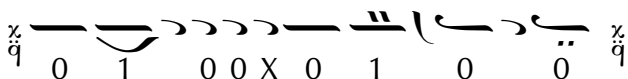
0100100 

10X0100 

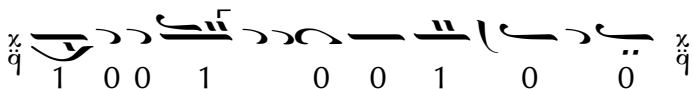
10000100 

10100100 



0100X0100 

010100100 

100100100 

Plagal First Mode - Heirmologic

10X0X0100 $\overset{\times}{q} \overbrace{1}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{X}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{X}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{1}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overset{\times}{q}$

1010000100 $\overset{\times}{q} \overbrace{1}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{1}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{1}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overset{\times}{q}$

Accented on fourth to last syllable:

From Ke

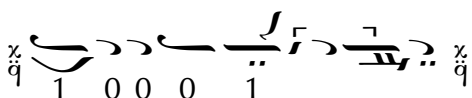
0001001 $\overset{\times}{q} \overbrace{0}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{1}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{1}^{\curvearrowright} \overset{\times}{q}$

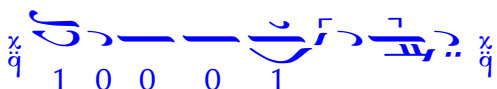
10001001 $\overset{\times}{q} \overbrace{1}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{1}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{0}^{\curvearrowright} \overbrace{1}^{\curvearrowright} \overset{\times}{q}$

E) Cadences for Theotokia*


Accented on last syllable:

From Ke

10001 

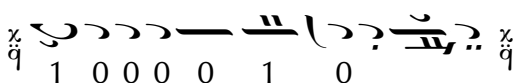
10001 

From Nee

010001 

Accented on second to last syllable:

From Ke

1000010 

100010 

From Nee

1000010 

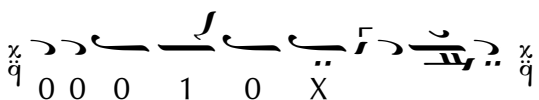
100100010 


* The formulae in blue in this section are from the Athonite oral tradition, as represented in the book *Παρακλητικῆς, Μουσικὸν Ἐγκόλπιον, Πλάγιοι Ἦχοι, Ἱεροθέου Ἱερομονάχου*, ἐκδόσεις Ἱ.Μ. Φιλοθέου, Ἁγίου Ὄρους, 2004.

Plagal First Mode - Heirmologic


Accented on third to last syllable:

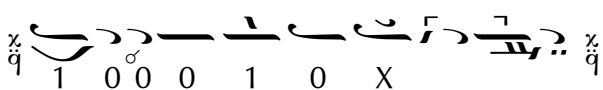
From Ke

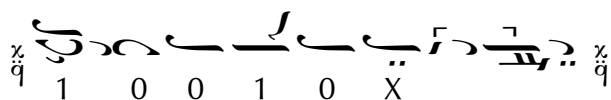
00010X  $\frac{x}{q}$ 0 0 0 1 0 X $\frac{x}{q}$

100100  $\frac{x}{q}$ 1 0 0 1 0 0 $\frac{x}{q}$


 $\frac{x}{q}$ 1 0 0 1 0 0 $\frac{x}{q}$

1000100  $\frac{x}{q}$ 1 0 0 0 1 0 0 $\frac{x}{q}$

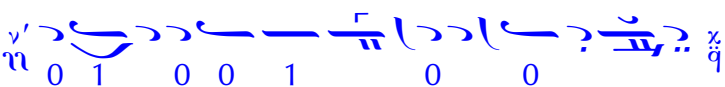
100010X  $\frac{x}{q}$ 1 0 0 0 1 0 X $\frac{x}{q}$

 $\frac{x}{q}$ 1 0 0 1 0 X $\frac{x}{q}$

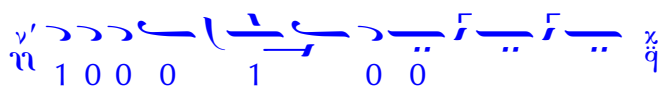
From Nee

100100  $\frac{x'}{q}$ 1 0 0 1 0 0 $\frac{x'}{q}$

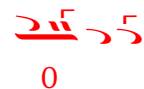
 $\frac{x'}{q}$ 1 0 0 1 0 0 $\frac{x'}{q}$

0100100  $\frac{x'}{q}$ 0 1 0 0 1 0 0 $\frac{x'}{q}$

1000100  $\frac{x'}{q}$ 1 0 0 0 1 0 0 $\frac{x'}{q}$

 $\frac{x'}{q}$ 1 0 0 0 1 0 0 $\frac{x'}{q}$

 $\frac{x'}{q}$ 1 0 0 0 1 0 $\frac{x'}{q}$

 $\frac{x'}{q}$ 0

Plagal First Mode - Heirmologic

Accented on fourth to last syllable:

1001 $\overset{\times}{q} \underbrace{\quad}_{1} \curvearrowright 0 \quad 0 \quad \underbrace{\quad}_{1} \curvearrowleft \curvearrowright \overset{\times}{q}$

BYZANTINE MUSIC FORMULÆ

Plagal First Mode - Verses (Tetraphonos)

Contents^{*}

A) Cadences on Di	504
B) Cadences on Ke	510
C) Cadences on High Nee	514
D) Formulae with Fthoras	516
E) Final Cadences	517

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

* The Byzantine music formulae herein were extracted from all the verses found in the *Zoe Anastasimatarion* (14th edition, 2002), the *Anastasimatarion* of Petros Peloponnesios (Mousike Bibliothke), and the *Neon Anastasimatarion* by Petros Ephesios. These formulae are applicable only to the brief verses (that are not immediately followed by troparia) of Psalms 140, 141, and 129 chanted in the beginning of Vespers immediately after "Lord I Have Cried" and the brief verses of Psalms 148, 149, and 150 chanted in Orthros immediately after "Let Every Breath."

Plagal First Mode - Verses (Tetrachonos)

A) Cadences on Di

Accented on last syllable:

From Di

00	$\overset{\Delta}{\underset{\cdot}{\text{di}}} \overset{\curvearrowright}{\text{—}} \overset{\Delta}{\underset{\cdot}{\text{di}}}$ 0 0
101	$\overset{\Delta}{\underset{\cdot}{\text{di}}} \overset{\text{—}}{\text{1}} \overset{\curvearrowright}{\text{—}} \overset{\Delta}{\underset{\cdot}{\text{di}}}$ 1 0 1
010001	$\overset{\Delta}{\underset{\cdot}{\text{di}}} \overset{\text{—}}{\text{0}} \overset{\text{—}}{\text{1}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\Delta}{\underset{\cdot}{\text{di}}}$ 0 1 0 0 0 1
0100101	$\overset{\Delta}{\underset{\cdot}{\text{di}}} \overset{\text{—}}{\text{0}} \overset{\text{—}}{\text{1}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\Delta}{\underset{\cdot}{\text{di}}}$ 0 1 0 0 1 0 1

From Ke

100001	$\overset{\times}{\underset{\cdot}{\text{ke}}} \overset{\text{—}}{\text{1}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\Delta}{\underset{\cdot}{\text{di}}}$ 1 0 0 0 0 1
100100001	$\overset{\times}{\underset{\cdot}{\text{ke}}} \overset{\text{—}}{\text{1}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\Delta}{\underset{\cdot}{\text{di}}}$ 1 0 0 1 0 0 0 0 1
0100100001	$\overset{\times}{\underset{\cdot}{\text{ke}}} \overset{\text{—}}{\text{0}} \overset{\text{—}}{\text{1}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\Delta}{\underset{\cdot}{\text{di}}}$ 0 1 0 0 1 0 0 0 0 1

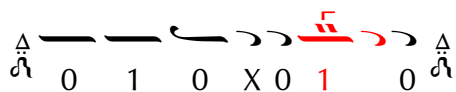
Accented on second to last syllable:

From Di

10	$\overset{\Delta}{\underset{\cdot}{\text{di}}} \overset{\text{—}}{\text{1}} \overset{\curvearrowright}{\text{—}} \overset{\Delta}{\underset{\cdot}{\text{di}}}$ 1 0
10010	$\overset{\Delta}{\underset{\cdot}{\text{di}}} \overset{\text{—}}{\text{1}} \overset{\curvearrowright}{\text{—}} \overset{\text{—}}{\text{0}} \overset{\text{—}}{\text{0}} \overset{\text{—}}{\text{1}} \overset{\curvearrowright}{\text{—}} \overset{\Delta}{\underset{\cdot}{\text{di}}}$ 1 0 0 1 0
010010	$\overset{\Delta}{\underset{\cdot}{\text{di}}} \overset{\text{—}}{\text{0}} \overset{\text{—}}{\text{1}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\Delta}{\underset{\cdot}{\text{di}}}$ 0 1 0 0 1 0

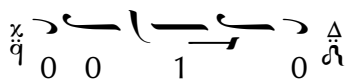
Plagal First Mode - Verses (Tetrachordos)

010X010

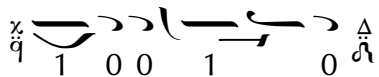


From Ke

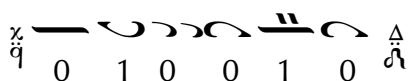
0010



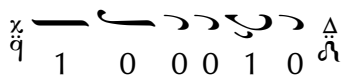
10010



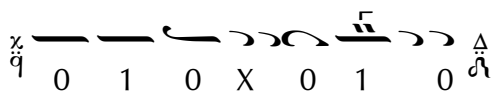
010010



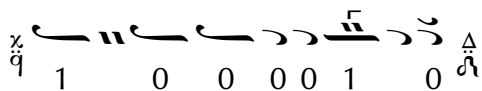
100010



010X010



1000010



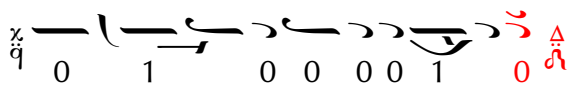
00010010



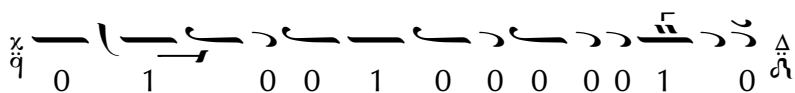
01000010



01000010




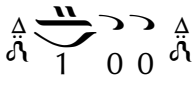
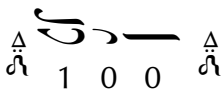
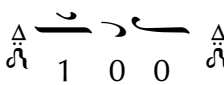
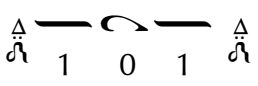


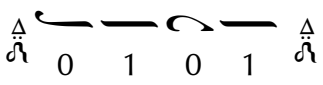
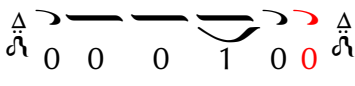
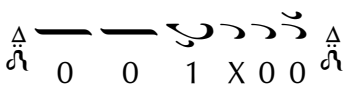
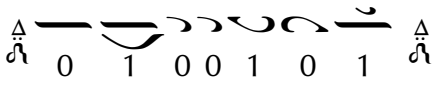
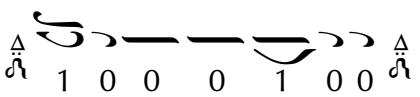
010010000010



Plagal First Mode - Verses (Tetrachordos)

Accented on third to last syllable:

From Di

100	
	
	
	
101	
0100	
	
0101	
000100	
001X00	
0100101	
1000100	



Plagal First Mode - Verses (Tetrachordos)

00100100

$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\frown}{\text{—}} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 1 0 0 0 1 0 0

00100100

$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 0 1 0 0 1 0 0

10000100

$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 1 0 0 0 0 1 0 0

From Ke

100

$\overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 1 0 0

$\overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 1 0 0

0

$\overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 1 0 0

0100

$\overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 1 0 0

1100

$\overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 1 1 0 0

00100

$\overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 0 1 0 0

10100

$\overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 1 0 1 0 0

000100

$\overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 0 0 1 0 0

010100

$\overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 1 0 1 0 0

1

0X0100

$\overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 X 0 1 0 0

Plagal First Mode - Verses (Tetrachonos)

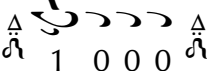
0100100

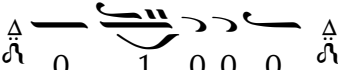
01000100

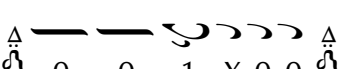
01010100100

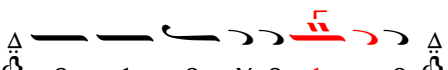
Accented on fourth to last syllable:

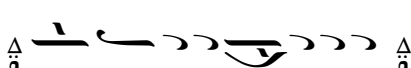
From Di

1000 


01000 


001X00 


010X010 

10001000 

From Ke

1000 

1010 

001000 

Plagal First Mode - Verses (Tetrachonos)

0101010

$\frac{x}{q}$

0101001010

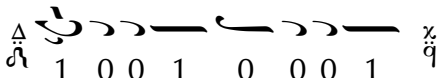
010100X010

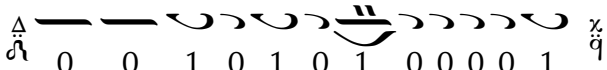
B) Cadences on Ke

These are used as initial formulae.

Accented on last syllable:

From Di

10010001 

001010100001 

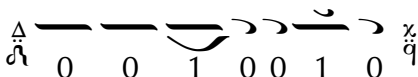
From Ke

1 

00 

Accented on second to last syllable:

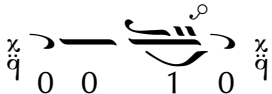
From Di

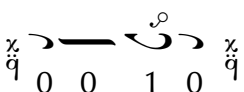
0010010 

From Ke

10 



0010 





Plagal First Mode - Verses (Tetraphonos)

00010	$\begin{array}{c} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ 0 \ 0 \ 0 \ 1 \ 0 \end{array}$
00X10	$\begin{array}{c} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ 0 \ 0 \ X \ 1 \ 0 \end{array}$
100010	$\begin{array}{c} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ 1 \ 0 \ 0 \ 0 \ 1 \ 0 \end{array}$
0100010	$\begin{array}{c} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ 0 \ 1 \ 0 \ 0 \ 0 \ 1 \ 0 \end{array}$
1000X010	$\begin{array}{c} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ 1 \ 0 \ 0 \ 0 \ X \ 0 \ 1 \ 0 \end{array}$

Accented on third to last syllable:

From Di

0100	$\begin{array}{c} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ 0 \ 1 \ 0 \ 0 \end{array}$
00100	$\begin{array}{c} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ 0 \ 0 \ 1 \ 0 \ 0 \end{array}$
100100	$\begin{array}{c} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ 1 \ 0 \ 0 \ 1 \ 0 \ 0 \end{array}$
00100101	$\begin{array}{c} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ 0 \ 0 \ 1 \ 0 \ 0 \ 1 \ 0 \ 1 \end{array}$
10000100	$\begin{array}{c} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ 1 \ 0 \ 0 \ 0 \ 0 \ 1 \ 0 \ 0 \end{array}$

From Ke

100	$\begin{array}{c} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ 1 \ 0 \ 0 \end{array}$
	$\begin{array}{c} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \text{̣} \\ 1 \ 0 \ 0 \end{array}$

Plagal First Mode - Verses (Tetraphonos)

	$\frac{x}{q} \overline{\text{—}} \text{—} \text{—} \frac{x}{q}$ 1 0 0
	$\frac{x}{q} \overline{\text{—}} \text{—} \text{—} \frac{x}{q}$ 1 0 0
0100	$\frac{x}{q} \overset{\circ}{\text{—}} \overline{\text{—}} \text{—} \text{—} \frac{x}{q}$ 0 1 0 0
10100	$\frac{x}{q} \overline{\text{—}} \text{—} \text{—} \text{—} \text{—} \frac{x}{q}$ 1 0 1 0 0
	$\frac{x}{q} \overline{\text{—}} \overline{\text{—}} \overset{\circ}{\text{—}} \text{—} \text{—} \frac{x}{q}$ 1 0 1 0 0
010100	$\frac{x}{q} \text{—} \overline{\text{—}} \overline{\text{—}} \overline{\text{—}} \text{—} \frac{x}{q}$ 0 1 0 1 0 0
100100	$\frac{x}{q} \overline{\text{—}} \text{—} \text{—} \overline{\text{—}} \text{—} \text{—} \frac{x}{q}$ 1 0 0 1 0 0
0010100	$\frac{x}{q} \text{—} \text{—} \overline{\text{—}} \text{—} \text{—} \text{—} \frac{x}{q}$ 0 0 1 0 1 0 0
1000100	$\frac{x}{q} \overline{\text{—}} \overline{\text{—}} \text{—} \text{—} \text{—} \text{—} \text{—} \frac{x}{q}$ 1 0 0 0 1 0 0
00010100	$\frac{x}{q} \text{—} \text{—} \text{—} \overline{\text{—}} \overline{\text{—}} \text{—} \text{—} \frac{x}{q}$ 0 0 0 1 0 1 0 0
01001000100	$\frac{x}{q} \overset{\circ}{\text{—}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\circ}{\text{—}} \text{—} \frac{x}{q}$ 0 1 0 0 1 0 0 0 1 0 0
	$\frac{x}{q} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overline{\text{—}} \text{—} \frac{x}{q}$ 0 1 0 0 1 0 0 0 1 0 0

Accented on fourth to last syllable:

From Di

Plagal First Mode - Verses (Tetrachordos)

1000 $\overset{\Delta}{\underset{\cdot\cdot}{\mathfrak{A}}} \overset{\frown}{\text{—}} \text{—} \text{—} \overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \begin{matrix} 1 & 0 & 0 & 0 \end{matrix}$

01010 $\overset{\Delta}{\underset{\cdot\cdot}{\mathfrak{A}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \begin{matrix} 0 & 0 & 1 & 0 & 1 & 0 \end{matrix}$

From Ke

1001 $\overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \overset{\circ}{\text{—}} \text{—} \text{—} \text{—} \overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \begin{matrix} 1 & 0 & 0 & 1 \end{matrix}$

1010 $\overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \overset{\circ}{\text{—}} \text{—} \text{—} \text{—} \overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \begin{matrix} 1 & 0 & 1 & 0 \end{matrix}$

01000 $\overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \begin{matrix} 0 & 1 & 0 & 0 & 0 \end{matrix}$

01001 $\overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \begin{matrix} 0 & \textcolor{red}{1} & 0 & 0 & 1 \end{matrix}$

$\textcolor{red}{\overset{\circ}{\text{—}}}$
 $\textcolor{red}{1}$

01010 $\overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \begin{matrix} 0 & 1 & 0 & 1 & 0 \end{matrix}$

001001 $\overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \begin{matrix} 0 & 0 & 1 & 0 & 0 & 1 \end{matrix}$

101000 $\overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \begin{matrix} 1 & 0 & 1 & 0 & 0 & 0 \end{matrix}$

01001000 $\overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \begin{matrix} 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 \end{matrix}$

$\overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \begin{matrix} 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 \end{matrix}$

1000X010 $\overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \overset{\circ}{\text{—}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \begin{matrix} 1 & 0 & 0 & 0 & \text{X} & 0 & 1 & 0 \end{matrix}$

01000001001 $\overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\times}{\underset{\cdot\cdot}{\mathfrak{q}}} \begin{matrix} 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 \end{matrix}$

C) Cadences on High Nee

Accented on last syllable:

From Ke

$$10001 \quad \begin{array}{c} \chi \\ \bar{q} \end{array} \begin{array}{c} \curvearrowright \\ 1 \end{array} \begin{array}{c} \curvearrowright \\ 0 \end{array} \begin{array}{c} \curvearrowright \\ 0 \end{array} \begin{array}{c} \curvearrowright \\ 0 \end{array} \begin{array}{c} \text{---} \\ 1 \end{array} \begin{array}{c} \gamma' \\ \bar{u} \end{array}$$

From High Nee

$$01 \quad \begin{array}{c} \gamma' \\ \text{u} \end{array} \supset \overline{\begin{array}{c} \gamma' \\ \text{u} \end{array}} \begin{array}{c} \gamma' \\ \text{u} \end{array}$$

Accented on second to last syllable:

From Ke

$$10 \quad \begin{array}{c} \text{z} \\ \text{q} \end{array} \begin{array}{c} \text{1} \\ \text{1} \end{array} \begin{array}{c} \text{z} \\ \text{0} \end{array} \begin{array}{c} \text{v}' \\ \text{n} \end{array}$$
$$0010 \quad \overbrace{q}^x \quad \overbrace{0}^{\quad} \quad \overbrace{0}^{\quad} \quad \overbrace{1}^{\quad} \quad \overbrace{0}^{\quad} \quad \overbrace{n}^{y'}$$
$$00010 \quad \begin{array}{c} x \\ q \end{array} \begin{array}{c} \curvearrowright \\ 0 \end{array} \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \curvearrowleft \\ 1 \end{array} \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \curvearrowright \\ n' \end{array}$$

From High Nee

$$10010 \quad \overset{\gamma'}{u} \text{---} \underset{1}{\curvearrowright} \text{---} \underset{0}{\curvearrowright} \text{---} \underset{0}{\curvearrowright} \text{---} \underset{1}{\curvearrowleft} \text{---} \underset{0}{\curvearrowleft} \text{---} \overset{\gamma'}{u}$$
$$\overset{\gamma'}{\mathfrak{U}} \quad \underbrace{\quad}_{1} \quad \underbrace{\quad}_{00} \quad \underbrace{\quad}_{1} \quad \underbrace{\quad}_{0} \quad \overset{\gamma'}{\mathfrak{U}}$$

010010

$\overset{\gamma'}{u}$
 $\overset{\gamma'}{0}$
 $\overset{\gamma'}{1}$
 $\overset{\gamma'}{0}$
 $\overset{\gamma'}{0}$
 $\overset{\gamma'}{1}$
 $\overset{\gamma'}{0}$
 $\overset{\gamma'}{u}$

100010

γ'
 γ'

1 0 0 0 1 0

0100010

γ'
 γ'

0 1 0 0 0 1 0

Plagal First Mode - Verses (Tetrachonos)

Accented on third to last syllable:

From Ke

100 $\overset{\times}{\underset{\cdot}{q}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\gamma'}{\underset{\cdot}{n}}$
 1 0 0

$\overset{\times}{\underset{\cdot}{q}} \overset{\text{—}}{\underset{\curvearrowright}{\text{—}}} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\gamma'}{\underset{\cdot}{n}}$
 1 0 0

Accented on fourth to last syllable:

From High Nee

1010 $\overset{\gamma'}{\underset{\cdot}{n}} \text{—} \overset{\curvearrowright}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\text{—}}{\text{—}} \overset{\curvearrowright}{\text{—}} \overset{\gamma'}{\underset{\cdot}{n}}$
 1 0 1 0

D) Formulae with Fthoras

0001 $\begin{array}{c} \overset{\sigma}{\Delta} \\ \underset{\sigma}{\Delta} \end{array} \begin{array}{c} \curvearrowright \\ 0 \end{array} \begin{array}{c} \curvearrowright \\ 0 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \overset{\sigma}{\text{—}} \\ 1 \end{array} \begin{array}{c} \Delta \\ \Delta \end{array}$

010 $\begin{array}{c} \overset{\sigma}{\Delta} \\ \underset{\sigma}{\Delta} \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \end{array} \begin{array}{c} \text{—} \\ 0 \end{array} \begin{array}{c} \overset{\sigma}{\text{—}} \\ 1 \end{array} \begin{array}{c} \Delta \\ \Delta \end{array}$

Plagal First Mode - Verses (Tetrachordos)

E) Final Cadences

Accented on last syllable:

From Di

[illegible]

010001

From Ke

[illegible]

010001

$\begin{array}{cccccc} \overline{x} & \overline{q} & & & & \overline{x} \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & 0 & 1 & 0 & 0 & 1 \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & 0 & 1 & 0 & 0 & 1 \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & 0 & 1 & 0 & 0 & 1 \end{array}$

Accented on second to last syllable:

From Di

00010 $\overset{\Delta}{\underset{\Delta}{\text{a}}}$ $\overset{\Delta}{\underset{\Delta}{\text{b}}}$ $\overset{\Delta}{\underset{\Delta}{\text{c}}}$ $\overset{\Delta}{\underset{\Delta}{\text{d}}}$ $\overset{\Delta}{\underset{\Delta}{\text{e}}}$ $\overset{\Delta}{\underset{\Delta}{\text{f}}}$ $\overset{\Delta}{\underset{\Delta}{\text{g}}}$

$$\begin{array}{ccccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ \partial & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \end{array}$$
$$\begin{array}{ccccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ \partial & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \end{array}$$

00X010

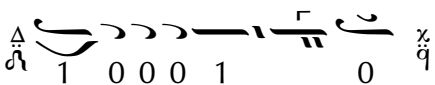
Δ	0	0	X	0	1	0	Σ
Δ	0	0	X	0	1	0	q

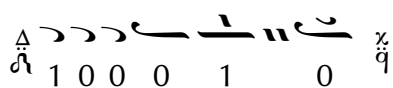
010010

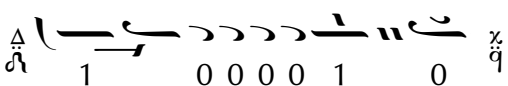
0 1 0 0 1 0

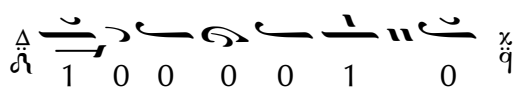
$$\begin{array}{cccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ \mathfrak{A} & 0 & 1 & 0 & 0 & 1 & 0 \\ & & & & & & \mathfrak{q} \end{array}$$


Plagal First Mode - Verses (Tetrachonos)

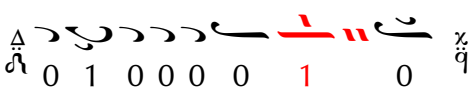
100010 

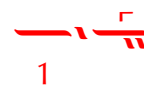


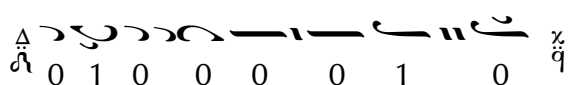
1000010 



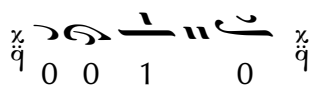
1010010 

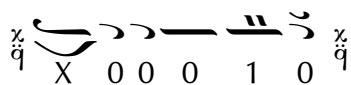
01000010 



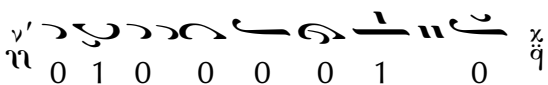


From Ke

0010 

X00010 

From High Nee

01000010 

01000X10 

Accented on third to last syllable:

From Di

Plagal First Mode - Verses (Tetrachonos)

00010X $\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{ — — — — — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}}$
 0 0 0 1 0 X

100100 $\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{ — — — — — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}}$
 1 0 0 1 0 0

0100100 $\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{ — — — — — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}}$
 0 1 — 0 0 1 0 0

1000100 $\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{ — — — — — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}}$
 1 0 0 0 1 0 0

$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{ — — — — — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}}$
 1 0 0 0 1 0 0

1000101 $\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{ — — — — — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}}$
 1 0 0 0 1 0 1

1100100 $\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{ — — — — — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}}$
 1 1 0 0 1 0 0

$\text{ — — — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}}$
 1 0 0

10000100 $\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{ — — — — — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}}$
 1 0 0 0 0 1 0 0

$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{ — — — — — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}}$
 1 0 0 0 0 1 0 0

10100100 $\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{ — — — — — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}}$
 1 0 1 0 0 1 0 0

From Ke

1000100 $\overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{ — — — — — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}}$
 1 0 0 0 1 0 0

From High Nee

1000100 $\overset{\vee}{\underset{\cdot}{\mathfrak{A}}} \text{ — — — — — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\times}{\underset{\cdot}{\mathfrak{q}}}$
 1 0 0 0 1 0 0

Accented on fourth to last syllable:

Plagal First Mode - Verses (Tetrachordos)

From Di

1001

01001

00X010

001001001

001001010

From Ke

0100X010

From High Nee

100001010



Plagal Second Mode



BYZANTINE MUSIC FORMULAE

Plagal Second Mode - Sticheraric

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* The Byzantine music formulae herein were extracted from sticheraric melodies found in the *Zoe Anastasi-matarion* (14th edition, 2002) Volume I of *Mousike Kypsele* (1883 edition), and the first volume of *Athonias* (1906 edition) by Petros Philanthidis.

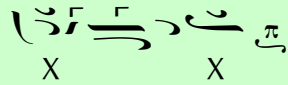
Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

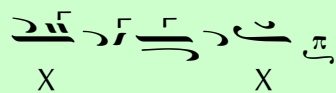
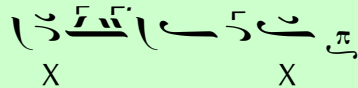
Variations of the same formula
are indicated in color

Medial Cadences on Pa

Note that all plagal second cadences with a "kylisma" of the old notation:



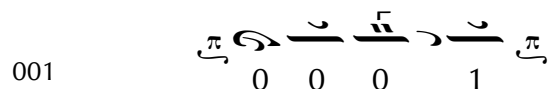
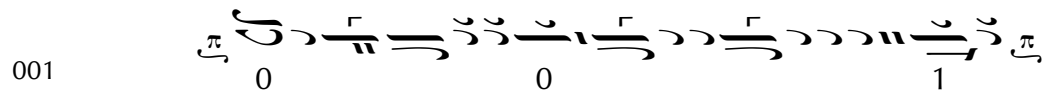
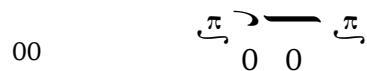
may be substituted by either of the following two cadences:



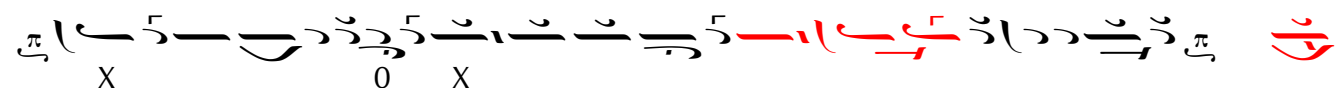
Also note that when using this melodic formula, it is usually the second to last syllable that is accentuated. It is only occasionally used for a word accentuated on the last syllable. Since such instances sound as if the melody incorrectly accentuates the text, these instances are highlighted in this section.

A) Accented on Last Syllable

Pa - Pa



XOX



Plagal Second Mode - Sticheraric

00000 π $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ π
0 0 0 0 0

Di - Pa

000 Δ $\overline{}$ $\overline{}$ $\overline{}$ π
 ρ 0 0 0

0001 Δ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ π
 ρ 0 0 0 1

10XX Δ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ π
 ρ 1 0 X X 1 0

00X0X Δ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ π
 ρ 0 0 X 0 X

Δ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$
 ρ 0 0 X

Δ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$
 ρ 0 0 X

Δ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$
 ρ 0 0 X

01001 Δ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ π
 ρ 0 1 0 0 1

10001 Δ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ π
 ρ 1 0 0 0 1

Δ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ π
 ρ 1 0 0 0 1

Δ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$
 ρ 0 0

010001 Δ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ $\overline{}$ π
 ρ 0 1 0 0 0 1

Plagal Second Mode - Sticheric

001001

100001

0010XX

110001


0010001

0100001

Plagal Second Mode - Sticheric

Plagal Second Mode - Sticheraric

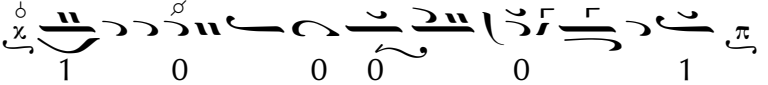
0X010001



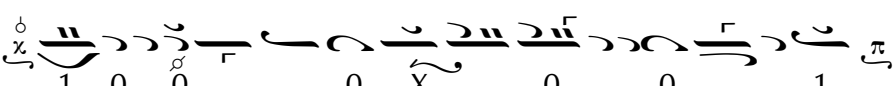
Ke - Pa

This section is almost empty because melodies in this mode rarely move from Ke directly to Pa.

100001



10001001



Plagal Second Mode - Sticheraric

B) Accented on Second to Last Syllable

Pa - Pa

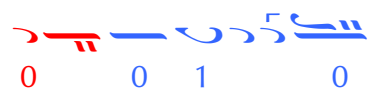
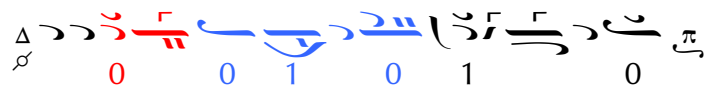
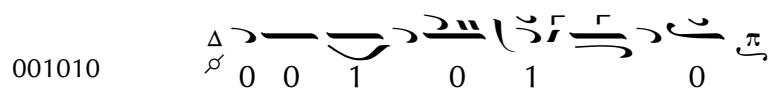
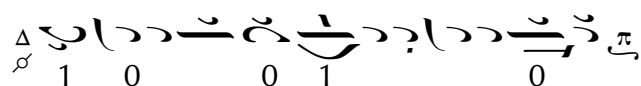
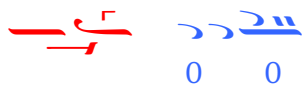
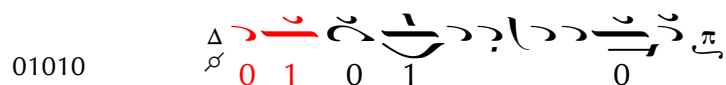
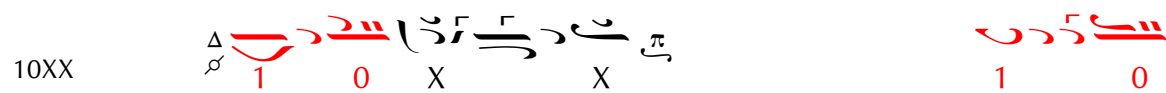
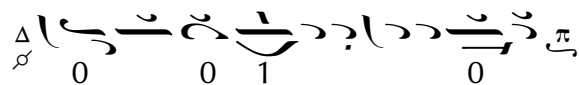
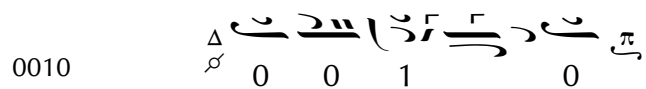
Most of these melodies may also be used as initial formulae.

10		10	
010		10	
0010			
1010			
00010			
01010			
10010			
010010			
100010			

Plagal Second Mode - Sticheraric



Di - Pa



Plagal Second Mode - Stichlaric

0010XX

Δ 0 0 1 0 X X π

1 0

010010

Δ 0 1 0 0 1 0 π

0

100010

Δ 1 0 0 0 1 0 π

1 0 0 0

0 0

110010

Δ 1 1 0 0 1 0 π

0100010

Δ 0 1 0 0 0 1 0 π

0

1001010

Δ 1 0 0 1 0 1 0 π

1 0 0 1 0

0 1 0

0 1 0

Plagal Second Mode - Stichleraric

The diagram illustrates the decomposition of the product of two 8-bit numbers into four 8-bit products. The numbers are represented as sequences of bits, with some bits highlighted in red or blue to show the carry propagation.

The numbers and their corresponding products are:

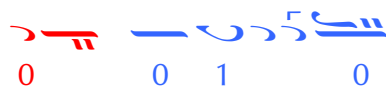
- X010010**: Δ π (X 0 1 0 0 1 0)
- 1000010**: Δ π (1 0 0 0 0 1 0)
- X0100010**: Δ π (X 0 1 0 0 0 1 0)
- 10000010**: Δ π (1 0 0 0 0 0 1 0)
- 10001010**: Δ π (1 0 0 0 1 0 1 0)

The products are shown as sums of four 8-bit terms, with some terms highlighted in red or blue to show the carry propagation.


The products are:

- X010010**: Δ π (X 0 1 0 0 1 0)
- 1000010**: Δ π (1 0 0 0 0 1 0)
- X0100010**: Δ π (X 0 1 0 0 0 1 0)
- 10000010**: Δ π (1 0 0 0 0 0 1 0)
- 10001010**: Δ π (1 0 0 0 1 0 1 0)

Plagal Second Mode - Sticheric






0X010010 

Ke - Pa

This section is almost empty because melodies in this mode rarely move from Ke directly to Pa.

010X010 

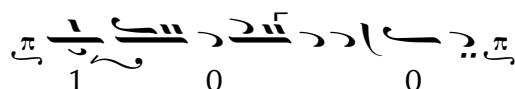
C) Accented on Third to Last Syllable

Pa - Pa

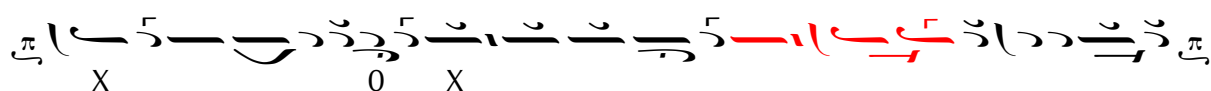
Most of these melodies may also be used as initial formulae.

100 




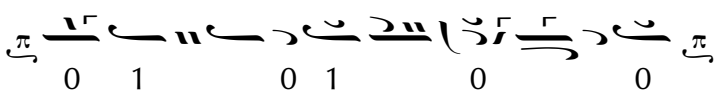



X0X

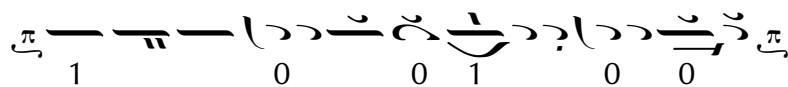


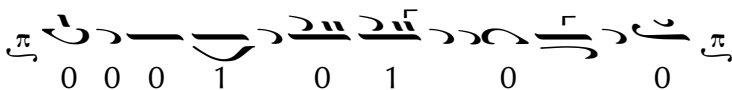


0100 

010100 

100100 



00010100 

Di - Pa

100 

Plagal Second Mode - Sticheric

X100 Δ $\begin{array}{c} \text{X} \\ \text{X} \end{array}$ 1 0 0 π

00100 Δ 0 0 1 0 0 π

00X0X Δ 0 0 X 0 X π

0 0 X

0 0 X

0 0 X

10100 Δ 1 0 1 0 0 π

Δ 1 0 1 0 0 π

010100 Δ 0 1 0 1 0 0 π

Δ 0 1 0 1 0 0 π

100100 Δ 1 0 0 1 0 0 π

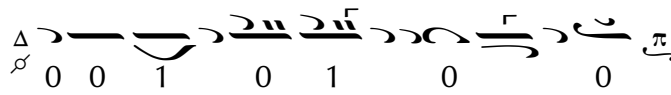
1 0 0

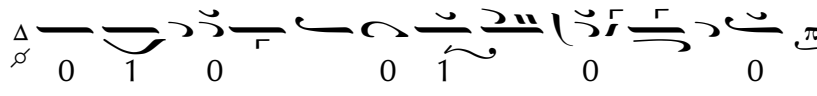
0 0

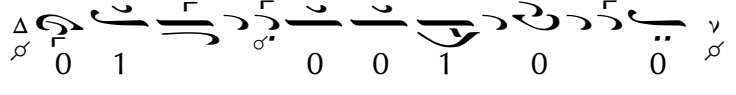
Δ 1 0 0 1 0 0 π

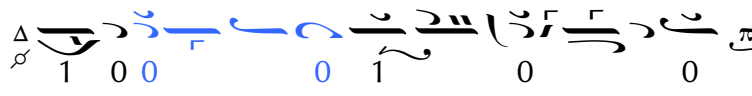
1


Plagal Second Mode - Sticheraric

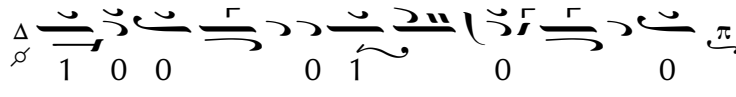
0010100 

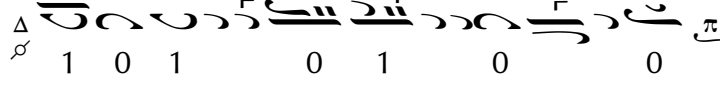
0100100 

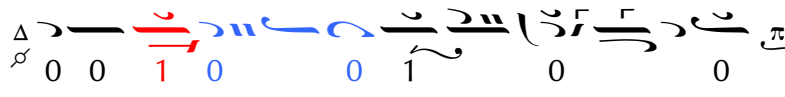
001010X 


1000100 

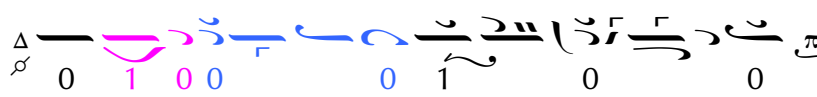


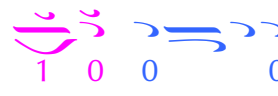
1010100 

1010100 

00100100 



01000100 



Ke - Pa

This section is almost empty because melodies in this mode rarely move from Ke directly to Pa.

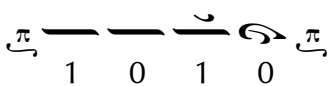
Plagal Second Mode - Sticheric

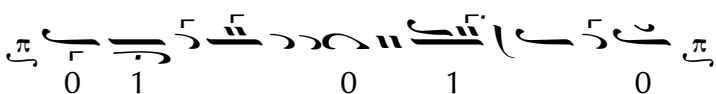
00100



D) Accented on Fourth to Last Syllable

Pa - Pa

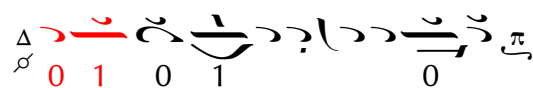
1010 

01010 

Di - Pa

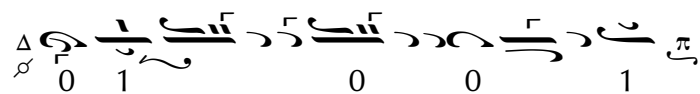
10XX 

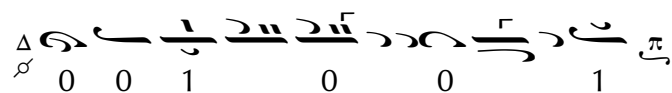
1001 

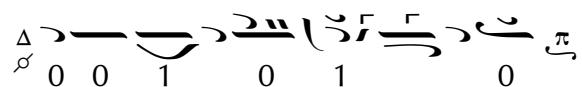
01010 

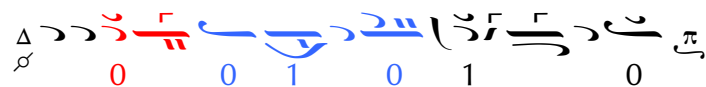




01001 

001001 

001010 





Plagal Second Mode - Sticheraric

0010XX

1001010

10001001

10001010

010X010

1000X001

Ke - Pa

This section is almost empty because melodies in this mode rarely move from Ke directly to Pa.

010X010

1000X001

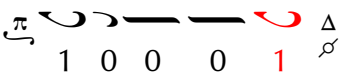

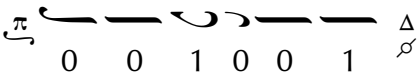
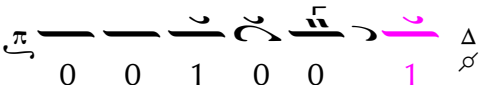


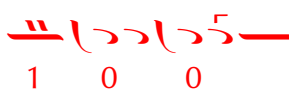
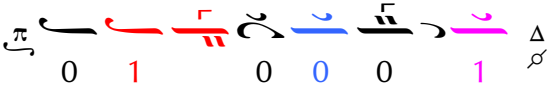

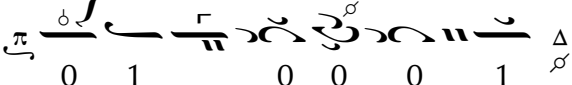
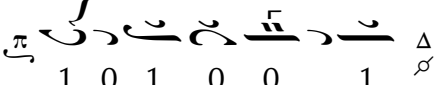
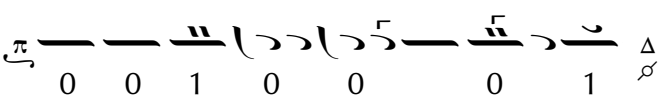
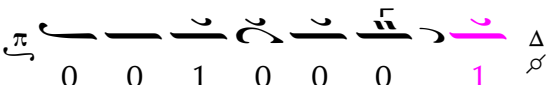

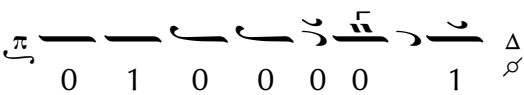
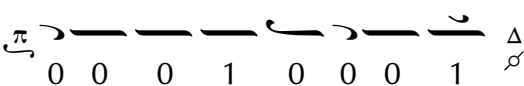
Medial Cadences on Di

E) Accented on Last Syllable

Pa - Di

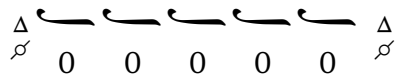
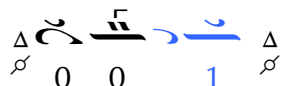
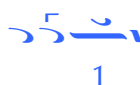
01		
001		
0X01		
0X01		
1001		
01001		
01X0X		
10001		

Plagal Second Mode - Sticheraric

	π 	
001001	π 	
	π 	
	π 	
010001	π 	
	π 	
101001	π 	
0010001	π 	
	π 	
0100001	π 	
00010001	π 	

Di - Di

This section is large because melodies in this mode frequently have more than one consecutive medial cadence on Di.

00000	Δ 	
001	Δ 	

Plagal Second Mode - Stichleraric

[illegible]

Plagal Second Mode - Sticheraric

1

Δ 1 0 0 0 1 Δ

1 0

1

010001

Δ 0 1 0 0 0 1 Δ 0 0

Δ 0 1 0 0 0 1 Δ 0 0

Δ 0 1 0 0 0 1 Δ

1 0 1

Δ 0 1 0 0 0 1 Δ

Δ 0 1 0 0 0 1 Δ

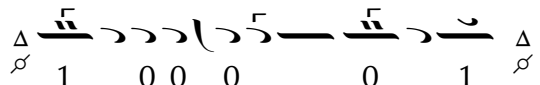
1 0 1

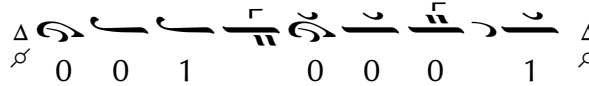
Δ 0 1 0 0 0 1 Δ

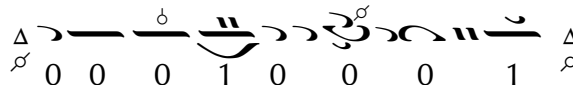
0 0 0 0

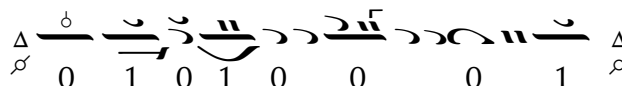
Δ 0 1 0 0 0 1 Δ

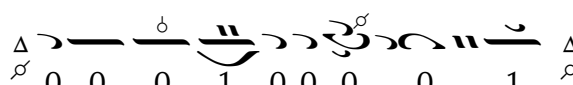
Plagal Second Mode - Sticheraric

100001 


0010001 

00010001 

01010001 


000100001 

Ke - Di

01 

10001 



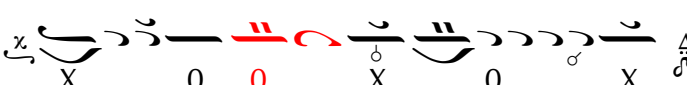
010001 



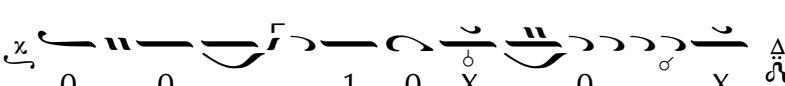
100001 

X00X0X 







0010X0X 

Plagal Second Mode - Sticheraric

0100X01	
0100X0X	
1000X0X	
00100X01	

F) Accented on Second to Last Syllable

Pa - Di

00 $\pi \frac{\text{—}}{0} \frac{\text{—}}{0} \Delta$

10 $\pi \frac{\text{—}}{1} \frac{\text{—}}{0} \Delta$

$\pi \frac{\text{—}}{1} \frac{\text{—}}{0} \Delta$

$\pi \frac{\text{—}}{1} \frac{\text{—}}{0} \Delta$

$\pi \frac{\text{—}}{1} \frac{\text{—}}{0} \Delta$

$\pi \frac{\text{—}}{1} \frac{\text{—}}{0} \Delta$

010 $\pi \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\text{—}}{0} \Delta$

$\pi \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\text{—}}{0} \Delta$

$\pi \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\text{—}}{0} \Delta$

$\pi \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\text{—}}{0} \Delta$

0010 $\pi \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\text{—}}{0} \Delta$

$\pi \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\text{—}}{0} \Delta$

$\pi \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\text{—}}{0} \Delta$

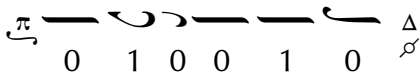
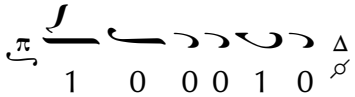
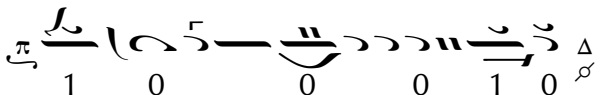
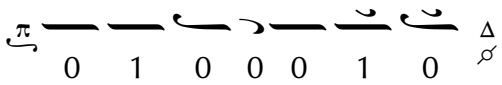

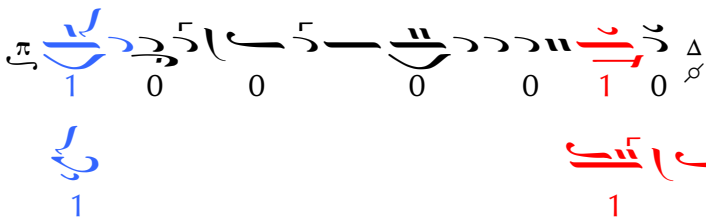
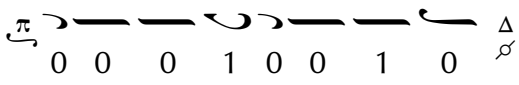
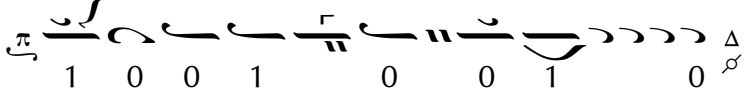
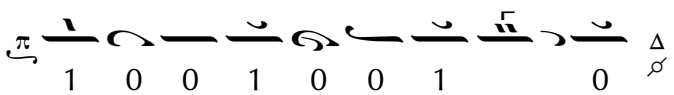
$\frac{\text{—}}{0} \Delta$

$\frac{\text{—}}{1} \frac{\text{—}}{0}$

Plagal Second Mode - Sticharic

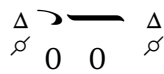
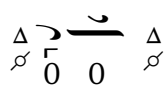
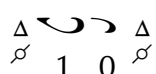
0X10	
00010	
01010	
10010	
001010	

Plagal Second Mode - Sticheraric

010010	
100010	
	
0100010	
010X010	
1000010	
00010010	
10010010	
	

Di - Di

This section is large because melodies in this mode frequently have more than one consecutive medial cadence on Di.

00	
	
10	

Plagal Second Mode - Stichleraric

$$\begin{array}{c} \Delta \quad \text{U} \quad \Delta \\ \text{1} \quad \text{0} \end{array}$$
$$\Delta_{\emptyset} \xrightarrow{1} \Delta_{\emptyset}$$

1

1

$$\Delta_{\emptyset} \text{ } \overset{\Delta}{\underset{\emptyset}{\curvearrowright}} \text{ } \overset{\Delta}{\underset{1}{\curvearrowright}} \text{ } \overset{\Delta}{\underset{\sim}{\curvearrowright}} \text{ } \overset{\Delta}{\underset{\ulcorner}{\curvearrowright}} \text{ } \overset{\Delta}{\underset{\urcorner}{\curvearrowright}} \text{ } \overset{\Delta}{\underset{\emptyset}{\curvearrowright}} \text{ } \Delta_{\emptyset}$$

010

$$\Delta \text{---} 0 \text{---} 1 \text{---} 0 \text{---} \Delta$$
$$\Delta_{\varnothing} \text{---} \underset{0}{\text{---}} \underset{1}{\text{---}} \text{---} \text{---} \underset{0}{\text{---}} \text{---} \Delta_{\varnothing}$$

0

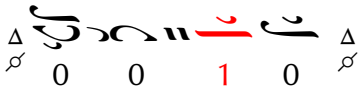
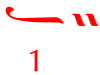
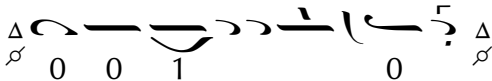
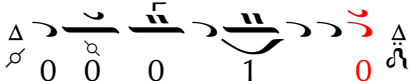



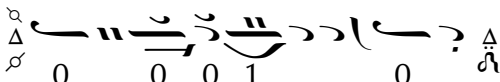
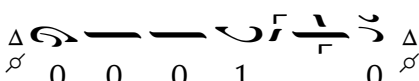
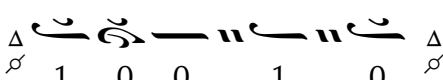

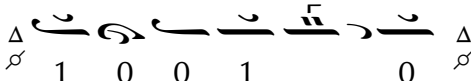
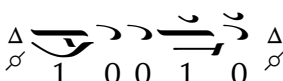
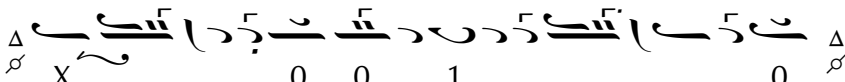
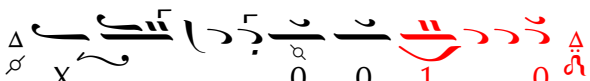

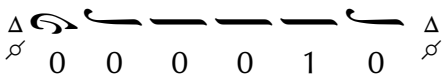

[illegible]
$$\Delta \begin{array}{c} \curvearrowright \\ \circlearrowleft \end{array} \quad \begin{array}{c} \text{---} \\ \text{---} \end{array} \quad \begin{array}{c} \text{---} \\ \text{---} \end{array} \quad \begin{array}{c} \text{---} \\ \text{---} \end{array} \quad \begin{array}{c} \text{---} \\ \text{---} \end{array} \quad \Delta \begin{array}{c} \curvearrowright \\ \circlearrowleft \end{array}$$

0 1

0010

$$\Delta \begin{array}{c} \curvearrowright \\ \circlearrowleft \end{array} \quad \begin{array}{c} \text{---} \\ \text{---} \end{array} \quad \begin{array}{c} \text{---} \\ \text{---} \end{array} \quad \begin{array}{c} \text{---} \\ \text{---} \end{array} \quad \Delta \begin{array}{c} \curvearrowright \\ \circlearrowleft \end{array}$$
$$\frac{1}{1}$$
$$\Delta \begin{array}{c} \curvearrowright \\ \circlearrowleft \end{array} \quad 0 \quad 0 \quad 1 \quad 0 \quad \begin{array}{c} \curvearrowleft \\ \circlearrowright \end{array} \Delta$$

Plagal Second Mode - Sticharic


		
		
00010		
		
		
		
10010		
		
		
		
X0010		
		
000010		
010010		

Plagal Second Mode - Sticheric


1

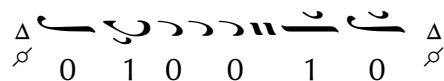

1 0

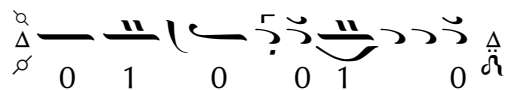

1 0


1 0

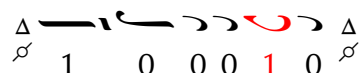

0 1 0 0 1 0


1 0


0 1 0 0 1 0

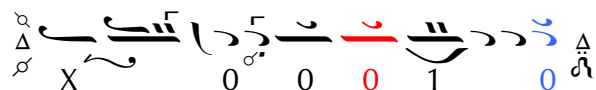

0 1 0 0 1 0

100010



1 0 0 0 1 0


1

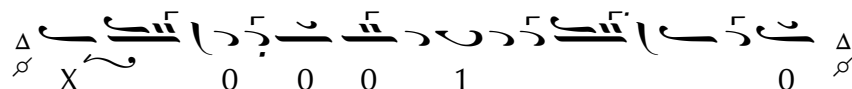
X00010


X 0 0 0 1 0

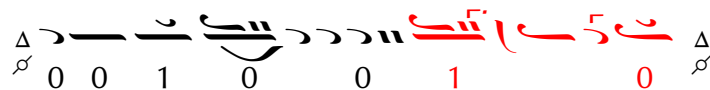

0


0


0

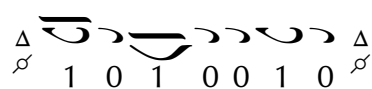

X 0 0 0 1 0

0010010

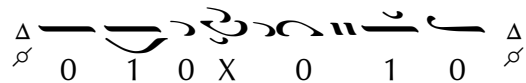

0 0 1 0 0 1 0


1 0

1010010


1 0 1 0 0 1 0

010X010


0 1 0 X 0 1 0

Plagal Second Mode - Sticheraric

Δ — 0 1 0 X 0 1 0 Δ
 0 1 0 0 1 0
 0 1 0

Δ — 0 1 0 X 0 1 0 Δ

0100010
 Δ — 0 1 0 0 0 1 0 Δ

01000010
 Δ — 0 1 0 0 0 0 1 0 Δ

01010010
 Δ — 0 1 0 1 0 0 1 0 Δ

Ke - Di

00
 Δ — 0 0 Δ

Δ — 0 0 Δ

10
 Δ — 1 0 Δ

010
 Δ — 0 1 0 Δ


110
 Δ — 1 1 0 Δ

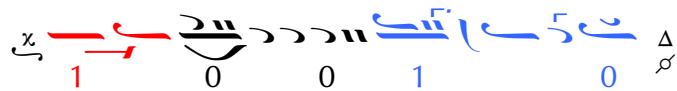
0010
 Δ — 0 0 1 0 Δ

0X010
 Δ — 0 X 0 1 0 Δ

Plagal Second Mode - Sticheric


1 0

10010 

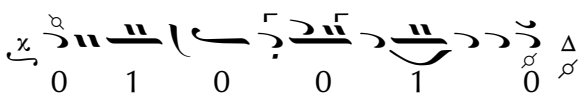


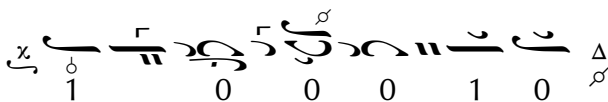


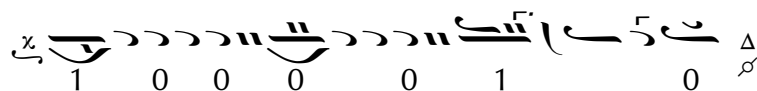


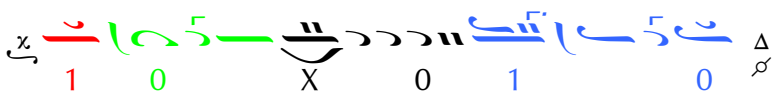


00X0X0 

010010 

100010 



10X010 







Plagal Second Mode - Stichlaric

000X010

100X010

100X010

1010010

G) Accented on Third to Last Syllable

Pa - Di

100		
0100		
0X01		
0X01		
0X10		
00100		

Plagal Second Mode - Sticheraric

	π 0 0 1 0 0 Δ	
10100		
	π 1 0 1 0 0 Δ	
010100		
	π 0 1 0 1 0 0 Δ	
100100		
	π 1 0 0 1 0 0 Δ	
0010100		
	π 0 0 1 0 1 0 0 Δ	
0100100		
	π 0 1 0 0 1 0 0 Δ	0 1
	π 0 1 0 0 1 0 0 Δ	
	π 0 1 0 0 1 0 0 Δ	1 0
00010100		
	π 0 0 0 1 0 1 0 0 Δ	1 0
00100100		
	π 0 0 1 0 0 1 0 0 Δ	
	π 0 0 1 0 0 1 0 0 Δ	

Di - Di

This section is large because melodies in this mode frequently have more than one consecutive medial cadence on Di.

100	Δ 1 0 0 Δ	Δ 1 0 0 Δ

Plagal Second Mode - Sticheraric

Δ $\frac{\text{c}}{\text{c}}$ 1 0 0 Δ

Δ $\frac{\text{c}}{\text{c}}$ 1 0 0 Δ

Δ $\frac{\text{c}}{\text{c}}$ 1 0 0 Δ

Δ $\frac{\text{c}}{\text{c}}$ 1 0 0 Δ

Δ $\frac{\text{c}}{\text{c}}$ 1 0 0 Δ

0100

Δ $\frac{\text{c}}{\text{c}}$ 0 1 0 0 Δ

Δ $\frac{\text{c}}{\text{c}}$ 0 1 0 0 Δ

Δ $\frac{\text{c}}{\text{c}}$ 0 1 0 0 Δ

Δ $\frac{\text{c}}{\text{c}}$ 0 1 0 0 Δ

Δ $\frac{\text{c}}{\text{c}}$ 0 1 0 0 Δ

Δ $\frac{\text{c}}{\text{c}}$ 0 1 0 0 Δ

Δ $\frac{\text{c}}{\text{c}}$ 0 1 0 0 Δ

0 0

Δ $\frac{\text{c}}{\text{c}}$ 0 1 0 0 Δ

0 1

Plagal Second Mode - Sticheraric

	Δ σ 0 1 σ 0 Δ	
	Δ σ 0 1 σ 0 Δ	
1X0X	Δ σ 1 X 0 X Δ	
	Δ σ 1 X 0 X Δ	
00100	Δ σ 0 0 1 0 0 Δ	
	Δ σ 0 0 1 0 0 Δ	Δ σ 0 Δ
	Δ σ 0 0 1 0 0 Δ	Δ σ 0 Δ
01100	Δ σ 0 1 1 0 0 Δ	
10100	Δ σ 1 0 1 0 0 Δ	
	Δ σ 1 0 1 0 0 Δ	
	Δ σ 1 0 1 0 0 Δ	Δ σ 0 Δ
	Δ σ 1 0 1 0 0 Δ	Δ σ 0 Δ
000100	Δ σ 0 0 0 1 0 0 Δ	Δ σ 0 Δ
	Δ σ 0 0 0 1 0 0 Δ	
	Δ σ 0 0 0 1 0 0 Δ	

Plagal Second Mode - Stichlaric

010100

Δ 0 1 0 1 0 0 Δ

1 0

Δ 0 1 0 1 0 0 Δ

Δ 0 1 0 1 0 0 Δ

Δ 0 1 0 1 0 0 Δ

Δ 0 1 0 1 0 0 Δ

1 0 1 0

100100

Δ 1 0 0 1 0 0 Δ

0

Δ 1 0 0 1 0 0 Δ

Δ 1 0 0 1 0 0 Δ

Δ 1 0 0 1 0 0 Δ

0

0

101X0X

Δ 1 0 1 X 0 X Δ

1 0

Plagal Second Mode - Sticharic

0100100

0101X0X

1000100

X000100

101010X

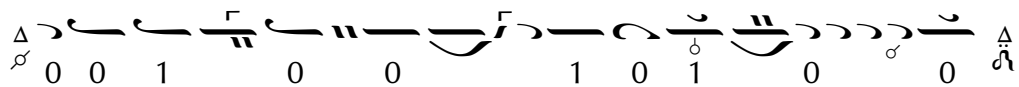
10X0100

00100100


01000100

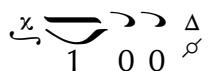
10100100

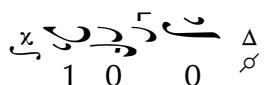
Plagal Second Mode - Sticheraric


0010010100 

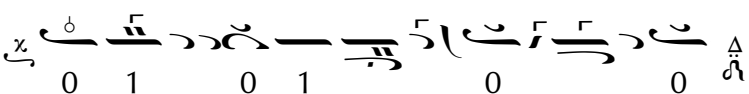
Ke - Di

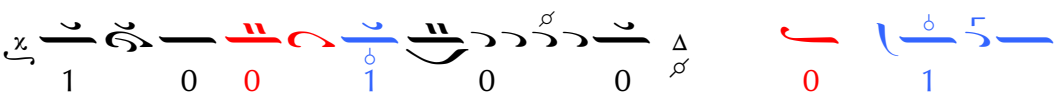
100 

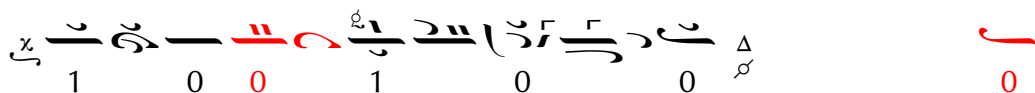


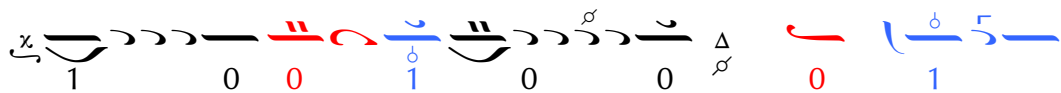



00100 

010100 

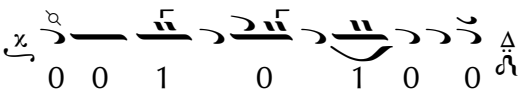
100100 

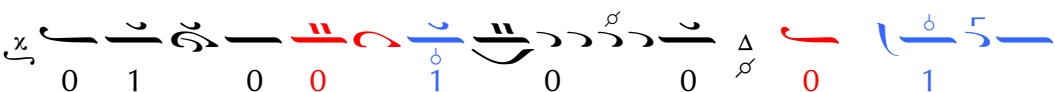


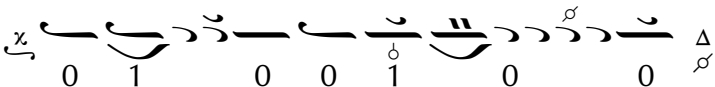


X00X0X 



0010100 

0100100 

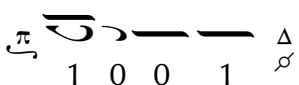
0100100 

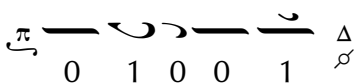
Plagal Second Mode - Sticheraric

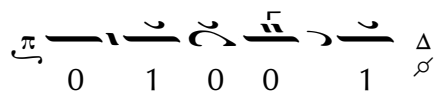
0010X0X		
0100X01		
0100X0X		
10X0100		
1000100		
1000X0X		
00100100		
01000100		

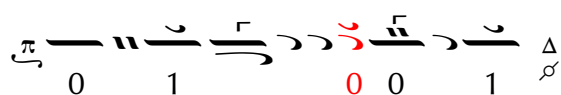
H) Accented on Fourth to Last Syllable

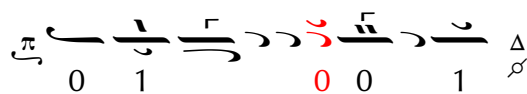
Pa - Di

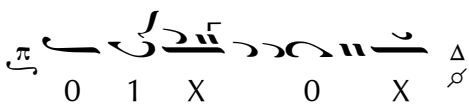
1001 

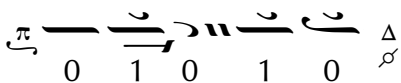
01001 

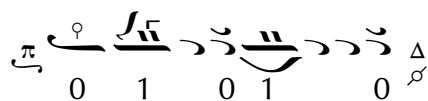


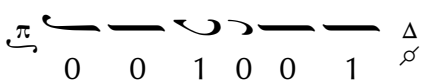


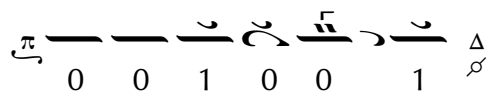


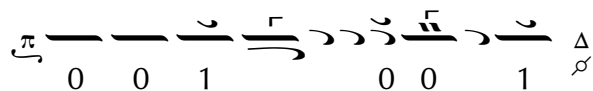
01X0X 

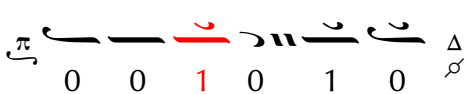
01010 




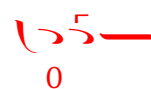
001001 

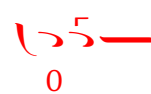




001010 

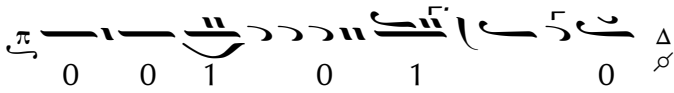




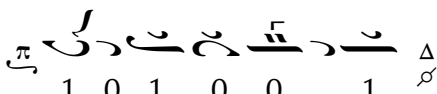





Plagal Second Mode - Sticheraric



 0 0 1 0 1 0

101001
 

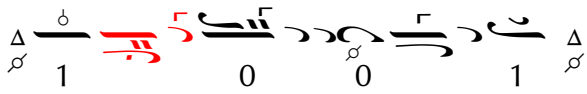
 1 0 1 0 0 1


010X010
 


 0 1 0 X 0 1 0


Di - Di

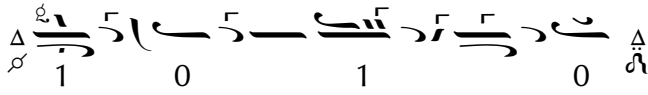
This section is large because melodies in this mode frequently have more than one consecutive medial cadence on Di.

1001
 

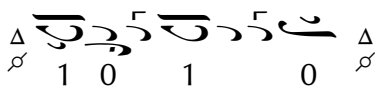
 1 0 0 1
 

1010
 

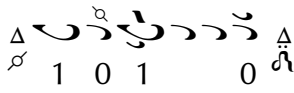
 1 0 1 0
 



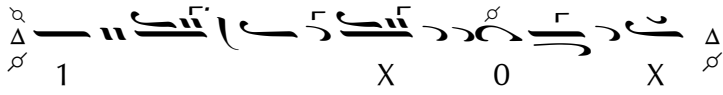
 1 0 1 0



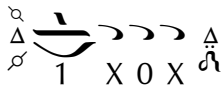
 1 0 1 0



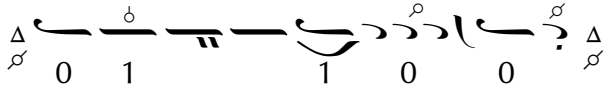
 1 0 1 0

1X0X
 

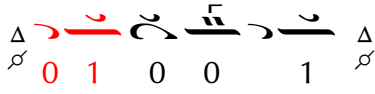
 1 X 0 X

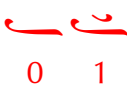


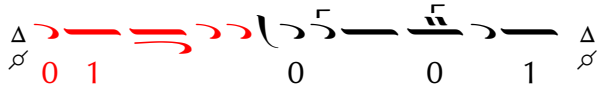
 1 X 0 X


01100
 

 0 1 1 0 0

01001
 

 0 1 0 0 1
 



 0 1 0 0 1
 

Plagal Second Mode - Sticharic

01010		
101001		
101010		
001010		
101X0X		
0101X0X		
0001001		
0001010		
0101010		
010X010		

Plagal Second Mode - Sticheraric

0 1 0

00101001

01001010

010001001

Ke - Di

01001


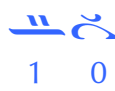

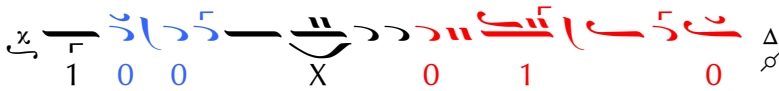

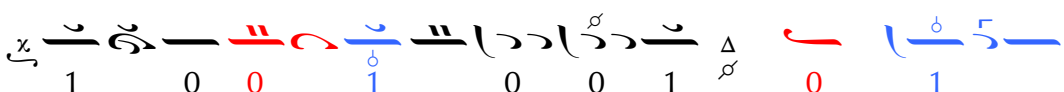
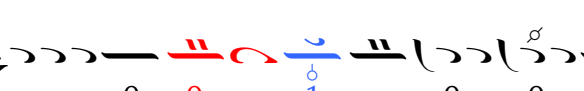
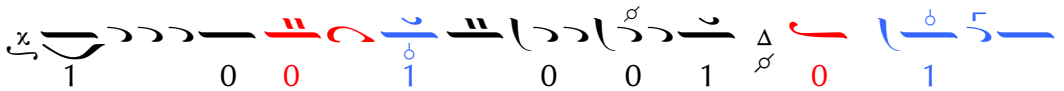

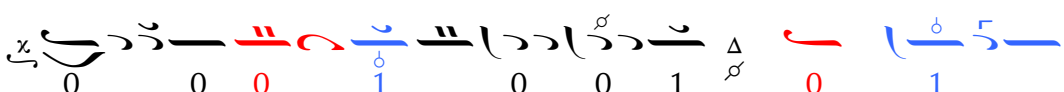

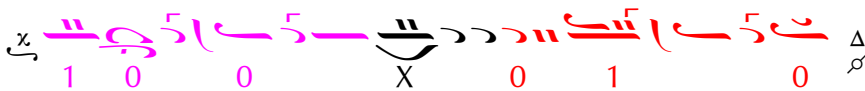





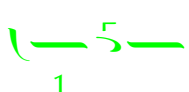

01010

0X010

00X0X0

10X010

Plagal Second Mode - Sticheric

		
		
100X010		
1001001		
X001001		
100X010		
		
		
		
		

Plagal Second Mode - Sticheraric

01001001

10X01001

10001001

001001001

010001001

Medial Cadences on Ke

I) Accented on Last Syllable

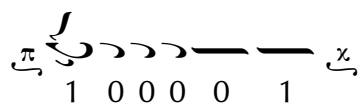
Pa - Ke

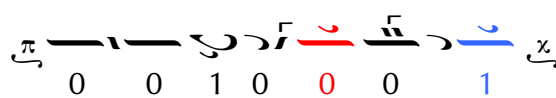

0	$\pi \overline{\quad} \text{z}$ 0
1	$\pi \overline{\quad} \text{z}$ 1
001	$\pi \overline{\quad} \overline{\quad} \overline{\quad} \text{z}$ 0 0 1
	$\pi \overline{\quad} \overline{\quad} \overline{\quad} \text{z}$ 0 0 1
X001	$\pi \overline{\quad} \overline{\quad} \overline{\quad} \text{z}$ X 0 0 1
1001	$\pi \overline{\quad} \overline{\quad} \overline{\quad} \text{z}$ 1 0 0 1
01001	$\pi \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \text{z}$ 0 1 0 0 1
10001	$\pi \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \text{z}$ 1 0 0 0 1
10X01	$\pi \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \text{z}$ 1 0 X 0 1
001001	$\pi \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \text{z}$ 0 0 1 0 0 1

(The above formula is usually found only near the end of a troparion.)

100001	$\pi \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \overline{\quad} \text{z}$ 1 0 0 0 0 1	$\overline{\quad} \overline{\quad} \text{z}'$ 1
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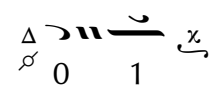
Plagal Second Mode - Sticheraric

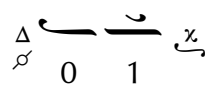
π  π
1 0 0 0 0 1

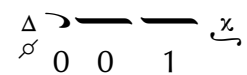
0010001 π  π  π
0 0 1 0 0 0 1 0 1

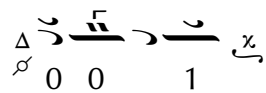
Di - Ke

0 Δ  π
0

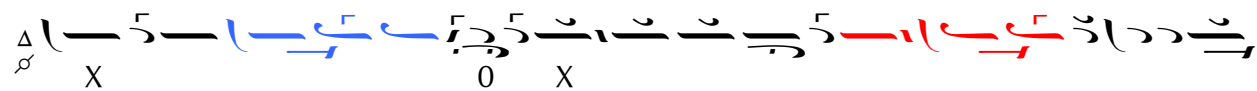
01 Δ  π
0 1

Δ  π
0 1

001 Δ  π
0 0 1

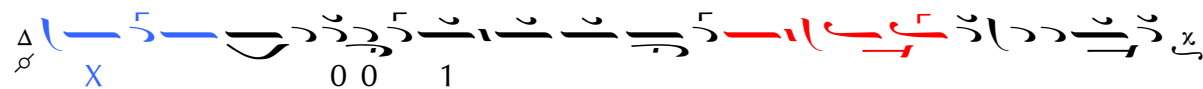
Δ  π
0 0 1

X0X

Δ  π
X 0 X

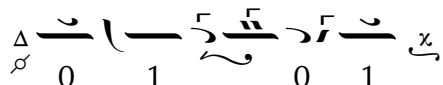
π  π

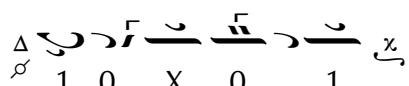
X001

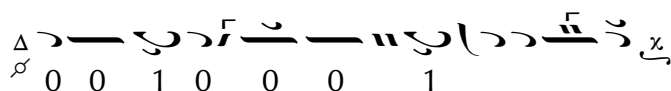
Δ  π
X 0 0 1

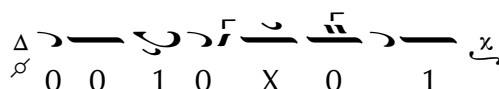
 π

Plagal Second Mode - Sticheraric

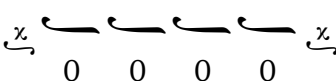
0101 

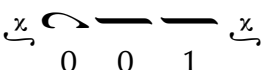
10X01 

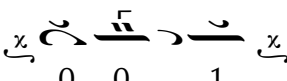
0010001 

0010X01 

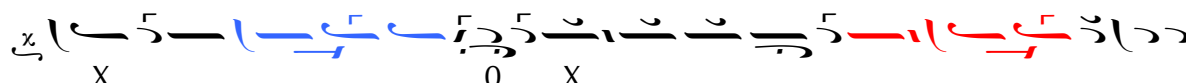
Ke - Ke

0000 


001 



X0X





0001 



X001

Plagal Second Mode - Sticheric

00X0X

10001

00X001

010001

100010X

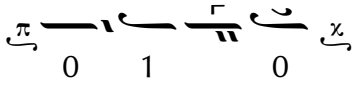
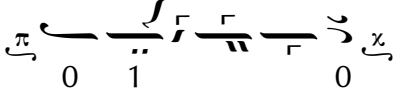
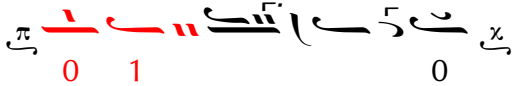
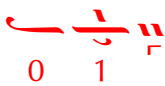


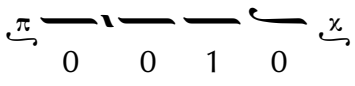
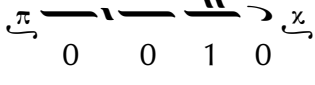

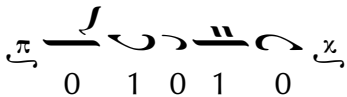
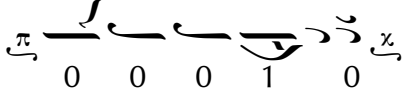
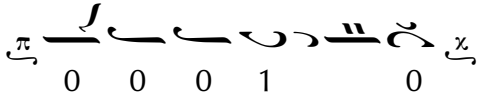
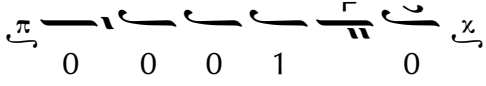
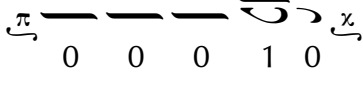
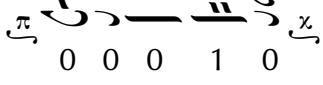
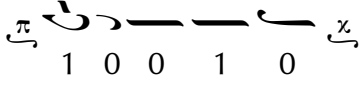
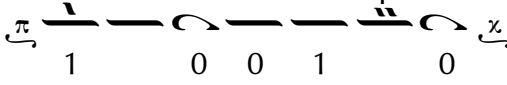
100010001

J) Accented on Second to Last Syllable

Pa - Ke

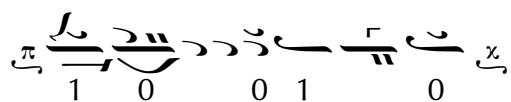
00	
10	
010	

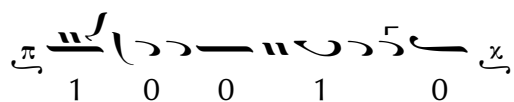
Plagal Second Mode - Sticheraric

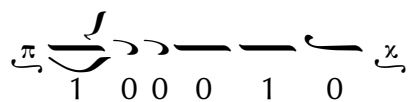
		
		
		
0010		
		
		
1010		
01010		
00010		
		
		
		
		
10010		

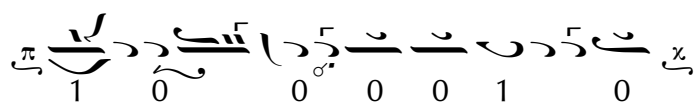
Plagal Second Mode - Sticheraric

π  π
1 0 0 1 0

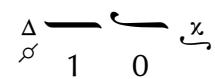
π  π
1 0 0 1 0

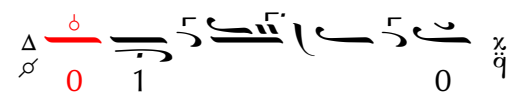

π  π
1 0 0 1 0

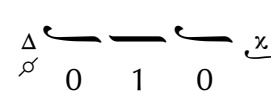

100010 π  π
1 0 0 0 1 0



1000010 π  π
1 0 0 0 0 1 0

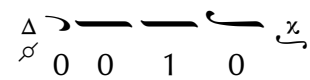
Di - Ke

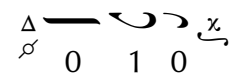
10 Δ  Δ
 ρ 1 0

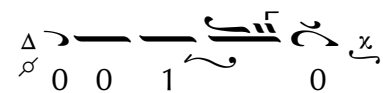
010 Δ  Δ 
 ρ 0 1 0 ρ

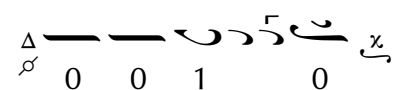
Δ  Δ 
 ρ 0 1 0 ρ

Δ  Δ 
 ρ 0 1 0 ρ

0010 Δ  Δ
 ρ 0 0 1 0

Δ  Δ
 ρ 0 1 0

Δ  Δ
 ρ 0 0 1 0

Δ  Δ
 ρ 0 0 1 0

Plagal Second Mode - Stichleraric

[illegible]

Ke - Ke

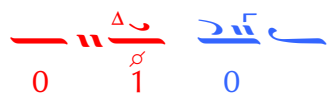
10

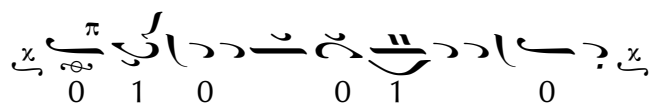
010

Plagal Second Mode - Sticheric

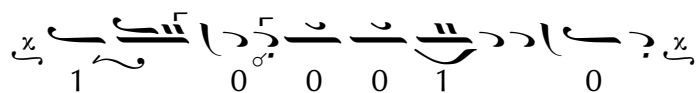
[illegible]

Plagal Second Mode - Sticheraric





100010

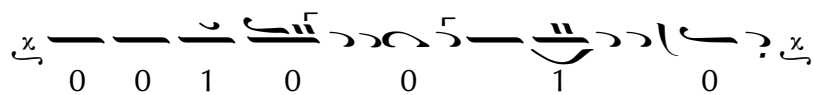


0100010





0010010



K) Accented on Third to Last Syllable

Pa - Ke

$$000 \quad \pi \quad \overbrace{\quad}^f \quad \underbrace{\quad}_0 \quad \underbrace{\quad}_0 \quad \underbrace{\quad}_0 \quad \chi$$
$$100 \quad \pi \quad \begin{array}{c} \text{L} \\ \hline 1 \end{array} \quad \begin{array}{c} \text{L} \\ \hline 0 \end{array} \quad \begin{array}{c} \text{L} \\ \hline 0 \end{array} \quad \chi$$
$$\pi \begin{array}{c} \text{---} \\ 1 \end{array} \text{---} \begin{array}{c} \text{---} \\ 0 \end{array} \text{---} \begin{array}{c} \text{---} \\ 0 \end{array} \chi$$
$$\pi \frac{1}{1} \frac{0}{0} \frac{1}{0} \frac{1}{0} \pi$$
$$0100 \quad \pi \frac{1}{0} \frac{1}{1} \frac{1}{00} \frac{1}{00} \chi$$
$$10100 \quad \pi \frac{1}{1} \frac{1}{0} \frac{1}{1} \frac{1}{0} \frac{1}{0} \gamma$$

X0100

[illegible]

000100

π
 χ

0 0 0 1 0 0

010100

100100

$$\begin{array}{ccccccc} \pi & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \chi \\ & 1 & & 0 & 0 & 1 & & 0 & 0 \end{array}$$

00100100

Plagal Second Mode - Stichleraric

Di - Ke
$$\begin{array}{c} \Delta \\ \text{X00} \quad \text{X} \quad 0 \quad 0 \end{array}$$

100 Δ
 ϕ 1 0 0 χ

$$\Delta \frac{\Delta \sigma}{\sigma} \frac{f}{1} \left(\begin{array}{c} \text{---} \\ \text{---} \end{array} \right)_{0} \left(\begin{array}{c} \text{---} \\ \text{---} \end{array} \right)_{0} \left(\begin{array}{c} \text{---} \\ \text{---} \end{array} \right)_{0}$$

XOX

0100 Δ $\frac{\text{---}}{\text{0}}$ $\frac{\text{---}}{\text{1}}$ $\frac{\text{---}}{\text{0}}$ $\frac{\text{---}}{\text{0}}$ $\frac{\text{---}}{\text{2}}$

0101

10X01 $\Delta \begin{matrix} \curvearrowright & \curvearrowright & \overline{\curvearrowright} & \overline{\curvearrowright} & \curvearrowright \\ \circlearrowleft & 1 & 0 & X & 0 & 1 & \circlearrowright \end{matrix}$

0010X01

Ke - Ke

100 $\begin{matrix} \curvearrowright & \overline{\curvearrowright} & \curvearrowright & \curvearrowright & \curvearrowright \\ & 1 & 0 & 0 & \end{matrix}$

$$\zeta_1 - \frac{1}{\zeta_0} \zeta_0 \zeta_1 - \frac{1}{\zeta_0} \zeta_0 \zeta_1$$


Plagal Second Mode - Stichleraric

000100

010100

100100

0100100


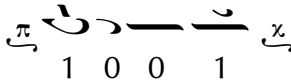
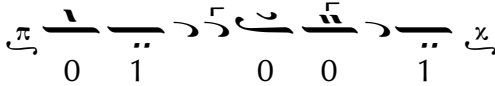
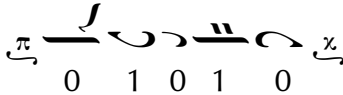
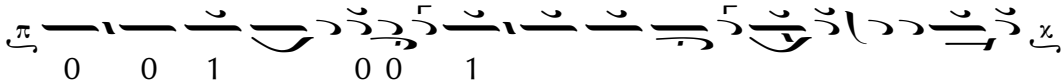


$$\begin{array}{ccc} 1 & 0 & 0 \\ 1 & 0 & 0 \end{array}$$

100010X

L) Accented on Fourth to Last Syllable

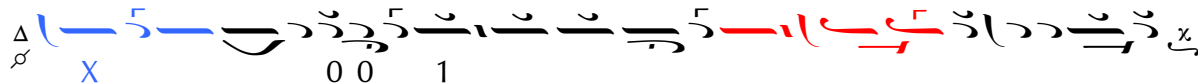


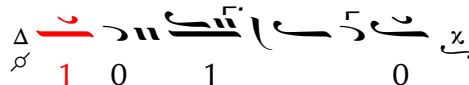



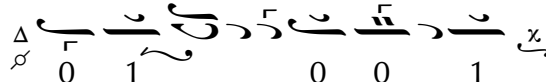
Pa - Ke

1010	
1001	
01001	
01010	
001001	

(The previous formula is usually found only near the end of a troparion.)

Di - Ke

X001

		
		
1010		
01001		
		

Ke - Ke

Plagal Second Mode - Sticheraric

01010

01X0X

X001

00X001

M) Fthoras

Accented on last syllable:

0001		
00001		
10001		

Plagal Second Mode - Sticheric

010001

010001

010001

100001

Accented on second to last syllable:

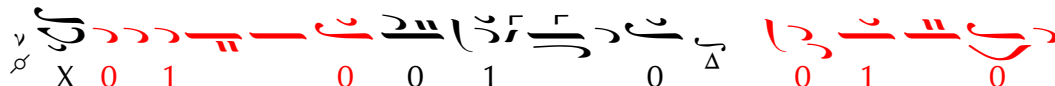
10

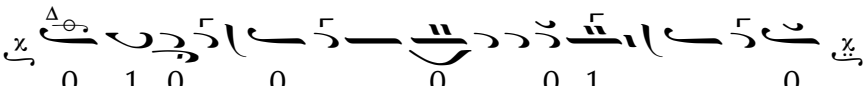
010

Plagal Second Mode - Sticheric

	$\begin{array}{c} \pi \\ \text{[Musical Notation]} \\ 0 \quad 1 \quad 0 \end{array}$	
	$\begin{array}{c} \pi \\ \text{[Musical Notation]} \\ 0 \quad 1 \quad 0 \end{array}$	
	$\begin{array}{c} \Delta \\ \text{[Musical Notation]} \\ 0 \quad 1 \quad 0 \end{array}$	$\begin{array}{c} \pi \\ \text{[Musical Notation]} \\ 0 \quad 1 \quad 0 \end{array}$
0010	$\begin{array}{c} \pi \\ \text{[Musical Notation]} \\ 0 \quad 0 \quad 1 \quad 0 \end{array}$	
	$\begin{array}{c} \Delta \\ \text{[Musical Notation]} \\ 0 \quad 0 \quad 1 \quad 0 \end{array}$	
	$\begin{array}{c} \Delta \\ \text{[Musical Notation]} \\ 0 \quad 0 \quad 1 \quad 0 \end{array}$	$\begin{array}{c} \pi \\ \text{[Musical Notation]} \\ 0 \quad 1 \quad 0 \end{array}$
	$\begin{array}{c} \pi \\ \text{[Musical Notation]} \\ 0 \quad 0 \quad 1 \quad 0 \end{array}$	
	$\begin{array}{c} \Delta \\ \text{[Musical Notation]} \\ 0 \quad 0 \quad 1 \quad 0 \end{array}$	
00010	$\begin{array}{c} \pi \\ \text{[Musical Notation]} \\ 0 \quad 0 \quad 0 \quad 1 \quad 0 \end{array}$	
0X010	$\begin{array}{c} \Delta \\ \text{[Musical Notation]} \\ 0 \quad X \quad 0 \quad 1 \quad 0 \end{array}$	
10010	$\begin{array}{c} \Delta \\ \text{[Musical Notation]} \\ 1 \quad 0 \quad 0 \quad 1 \quad 0 \end{array}$	
	$\begin{array}{c} \pi \\ \text{[Musical Notation]} \\ 1 \quad 0 \quad 0 \quad 1 \quad 0 \end{array}$	$\begin{array}{c} \pi \\ \text{[Musical Notation]} \\ 1 \quad 0 \end{array}$
0100010	$\begin{array}{c} \Delta \\ \text{[Musical Notation]} \\ 0 \quad 1 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \end{array}$	$\begin{array}{c} \pi \\ \text{[Musical Notation]} \\ 1 \quad 0 \end{array}$
	$\begin{array}{c} \pi \\ \text{[Musical Notation]} \\ 0 \quad 1 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \end{array}$	$\begin{array}{c} \pi \\ \text{[Musical Notation]} \\ 1 \quad 0 \end{array}$

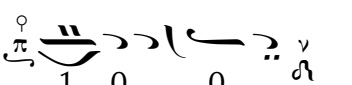
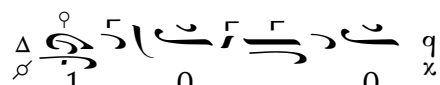
Plagal Second Mode - Sticheric

X010010 

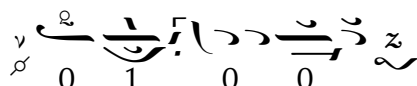
01000010 

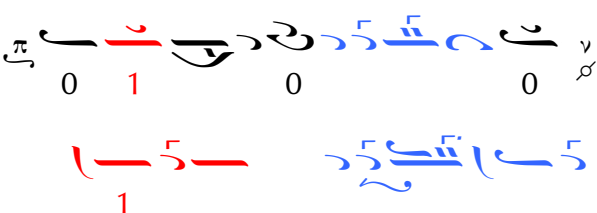
Accented on third to last syllable:

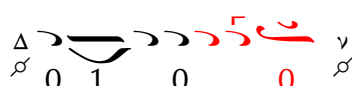
100 

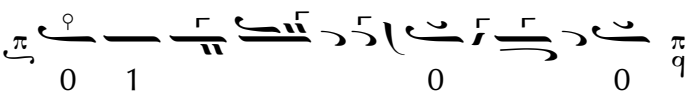
 


0100 











00100  



Plagal Second Mode - Sticheric

X00X0X

0100100

1000100

100100

Accented on fourth to last syllable:

1010

0X010

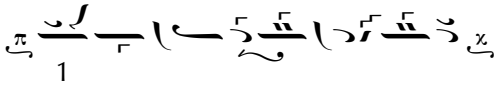
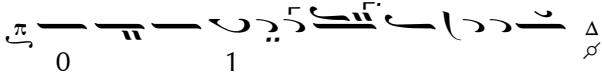

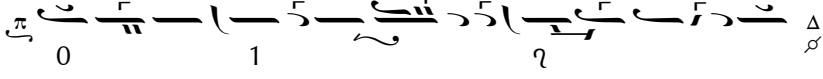
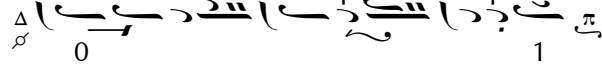
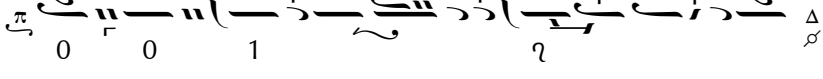

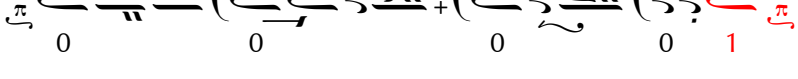

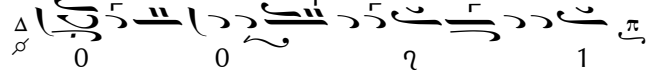
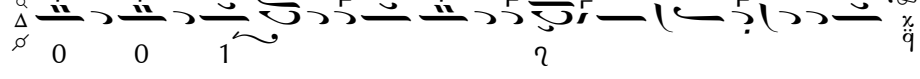
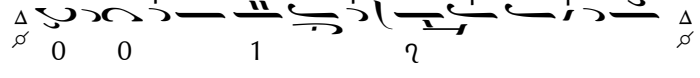
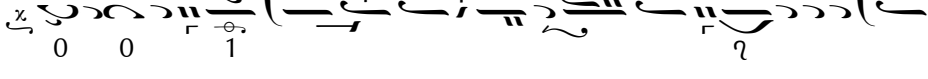

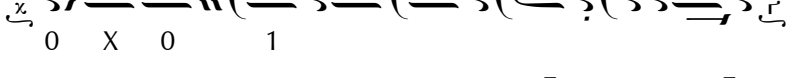
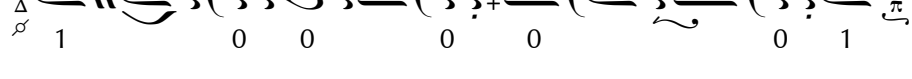
001001

001010

1001010

N) Old (slow) Sticheric Formulae

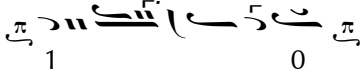
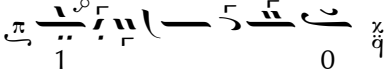
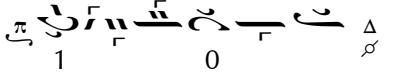
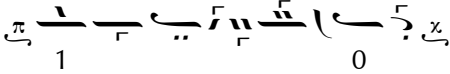
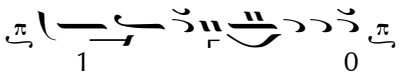
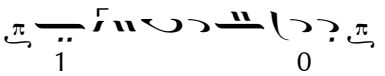


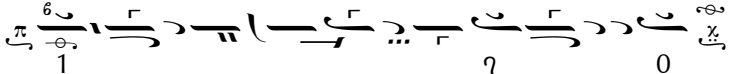
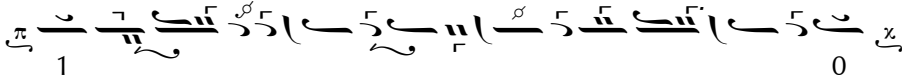

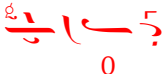
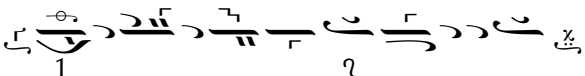
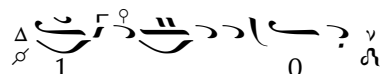
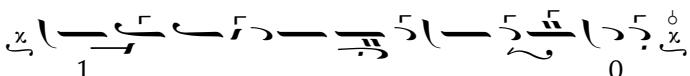
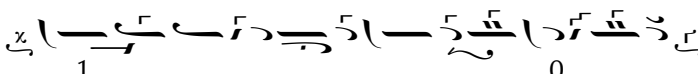

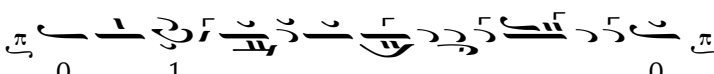

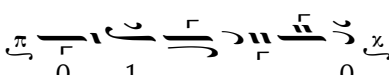
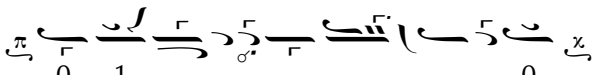
Accented on last syllable:

1	
01	
01	
01	
01	
001	
001	
001	
	
001	
001	
001	
001	
	
0X01	
10001	

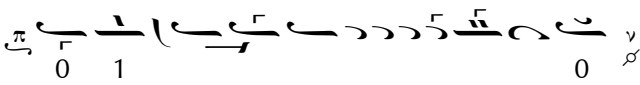
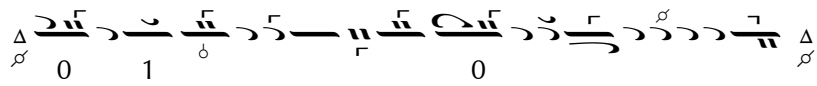
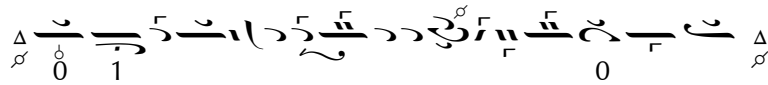
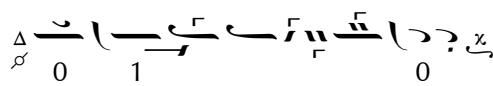
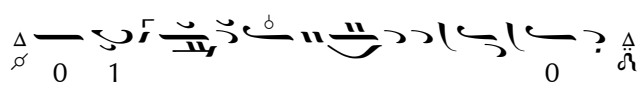
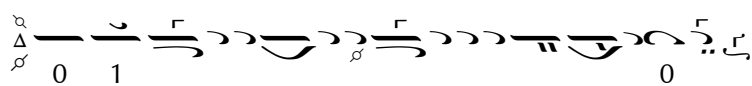


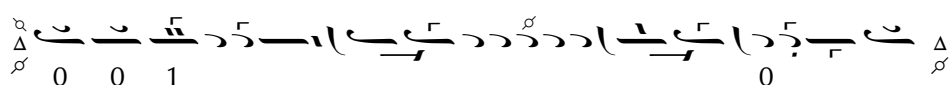
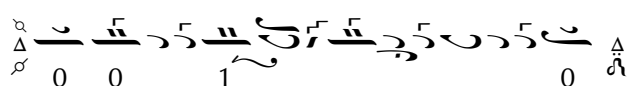
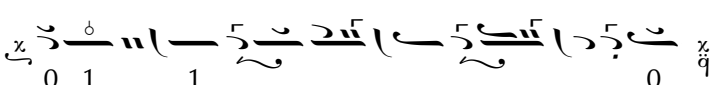
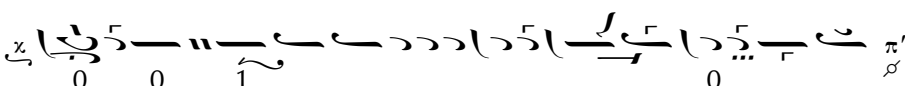
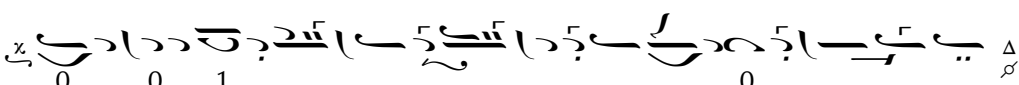
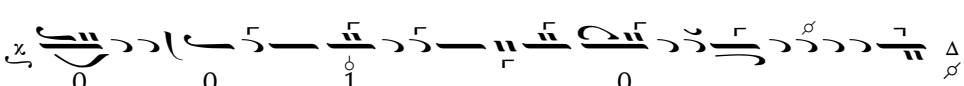
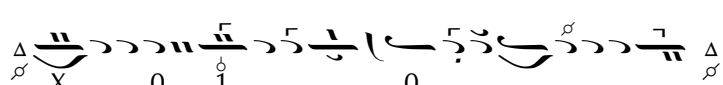
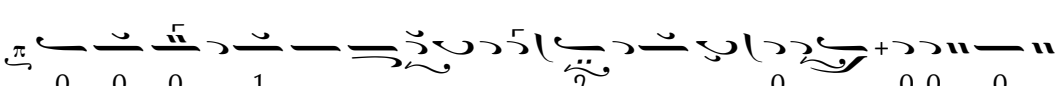

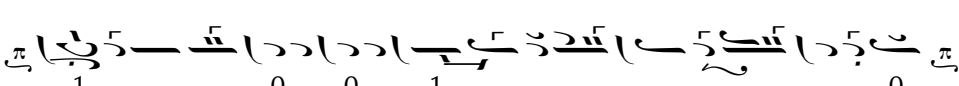
Plagal Second Mode - Sticheric

10001	π $\frac{1}{1}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{1}{1}$ π
10001	Δ $\frac{1}{1}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$
	$\frac{0}{0}$ $\frac{1}{1}$ π
10001	Δ $\frac{1}{1}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{1}{1}$ π
10001	Δ $\frac{1}{1}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{1}{1}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{1}{1}$ π
10001	$\frac{1}{1}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{1}{1}$ $\frac{0}{0}$ π'
10X01	$\frac{0}{0}$ $\frac{0}{0}$ $\frac{1}{1}$ $\frac{0}{0}$ $\frac{X}{X}$ $\frac{0}{0}$
	$\frac{1}{1}$ $\frac{0}{0}$ $\frac{1}{1}$ Δ
X0001	Δ $\frac{X}{X}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$
	$\frac{0}{0}$ $\frac{1}{1}$ π
0100X1	π $\frac{0}{0}$ $\frac{1}{1}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{X}{X}$ $\frac{1}{1}$ π
100001	$\frac{1}{1}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$
	$\frac{0}{0}$ $\frac{1}{1}$ π
0010001	π $\frac{0}{0}$ $\frac{0}{0}$ $\frac{1}{1}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$
	$\frac{0}{0}$ $\frac{1}{1}$ π
00010001	π $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{1}{1}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{0}{0}$ $\frac{1}{1}$ π

Accented on second to last syllable:

10		
10		
10		
10	 	
10		
10		
10	 	
10		
10		
10		
10		
10		
010		
010		
010		
010		

Plagal Second Mode - Sticheric

010	
010	
010	
010	
010	
010	
010	
010	
0010	
0010	
0010	
0010	
0010	
0010	
X010	
00010	
	
10010	

Plagal Second Mode - Stichleraric

10010

010010

000010

000010

010010

010010

0010010

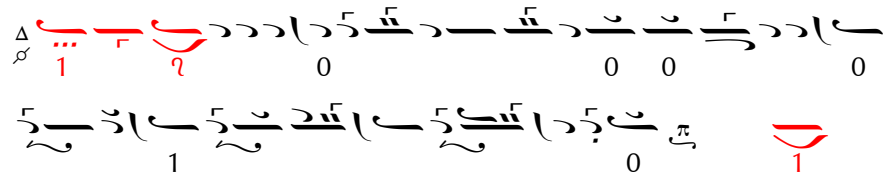
0010010

0100010

010X010

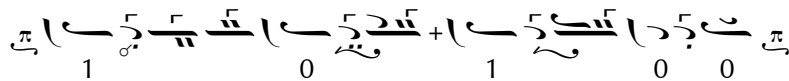
Plagal Second Mode - Sticheric

1000010

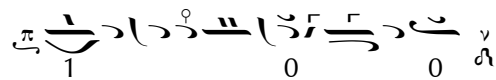


Accented on third to last syllable:

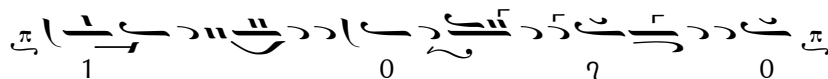
100



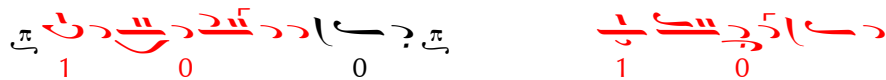
100



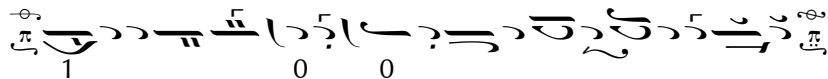
100



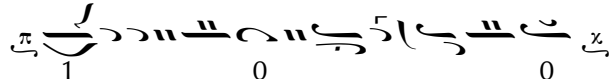
100



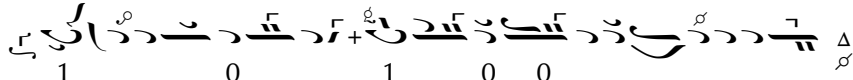
100



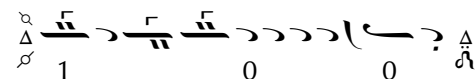
100



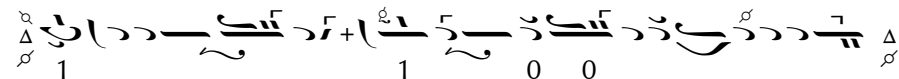
100



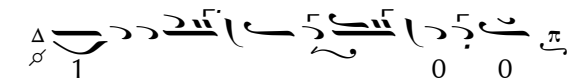
100



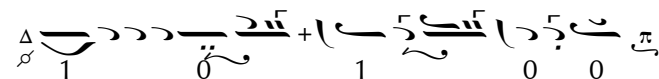
100



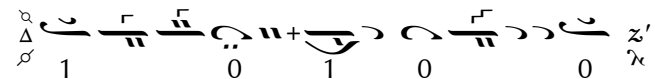
100



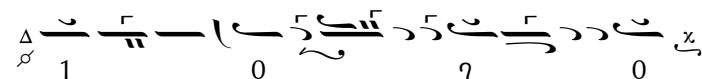
100



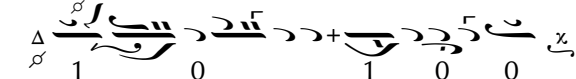
100



100



100



Plagal Second Mode - Stichleraric

[illegible]

Plagal Second Mode - Stichlaric

[illegible]

Plagal Second Mode - Sticheric

00100

00100

X0100

00100

10100

10100

010100

100100

X00100

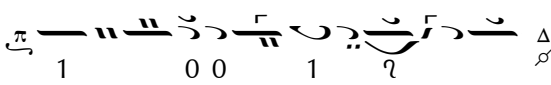
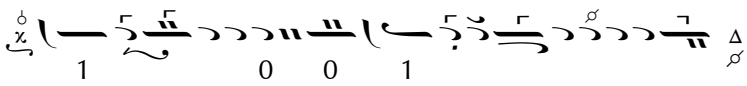
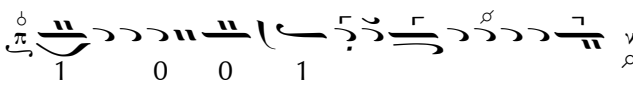
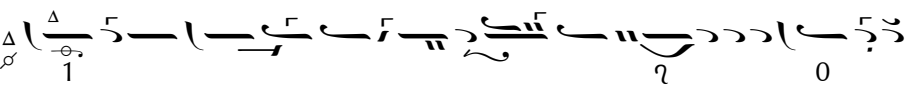
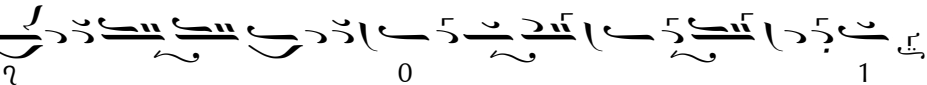
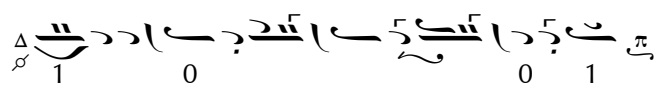
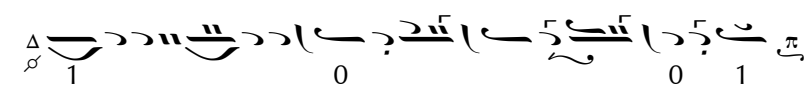

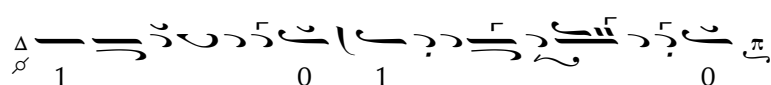
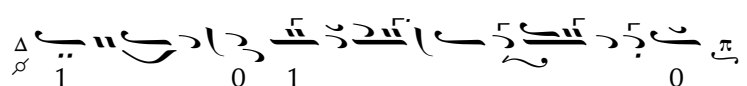
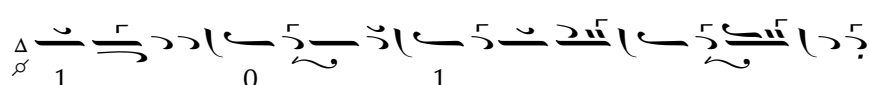

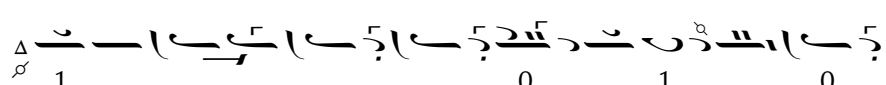

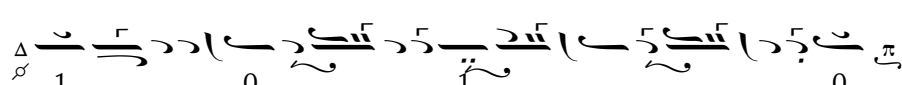

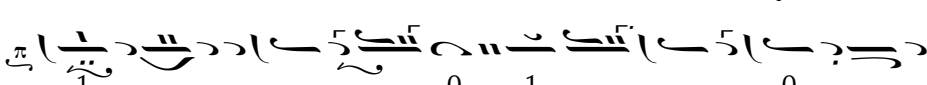
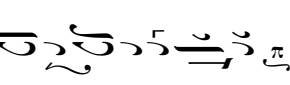
Plagal Second Mode - Sticheric

X00100	Δ σ
000100	Δ σ
100100	Δ σ
100100	Δ σ
1000100	Δ σ
1000100	Δ σ
1010100	Δ σ
10100100	Δ σ
10100100	Δ σ

Accented on fourth to last syllable:

1001	Δ σ	Δ σ
1001	Δ σ	Δ σ

Plagal Second Mode - Sticheric

1001	
1001	
1001	
1001	
	
1001	
1001	
1010	
1010	
1010	
1010	
	
1010	
	
1010	
1010	
1010	
	

Plagal Second Mode - Sticheric

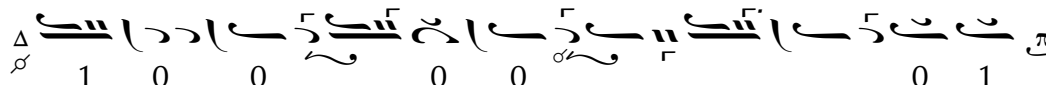
X010	Δ ρ	$\frac{\pi}{X}$	0	1	0	Δ ρ
X010	Δ ρ	$\frac{\pi}{X}$	0	1	0	Δ ρ
01001	Δ ρ	0	1	0	0	
		1				
OX010	Δ ρ	0	X	0	1	0
01010	Δ ρ	0	1	0	0	0
		1	0	1	0	
01010	Δ ρ	0	1	0	1	0
001001	Δ ρ	0	0	1	0	0
001001	Δ ρ	0	0	1	0	0
		1				
X01001	Δ ρ	X	0	1	0	0
001010	Δ ρ	0	0	1	0	0
		1	0	1	0	

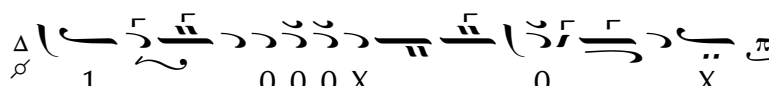
O) Final Cadences

Accented on last syllable:

[illegible]

Plagal Second Mode - Sticheraric

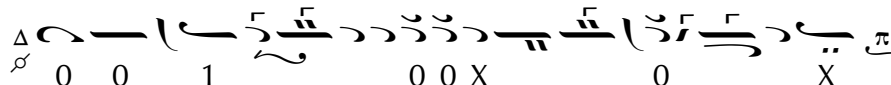
1000001 

1000X0X 

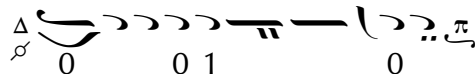
10X0X0X 

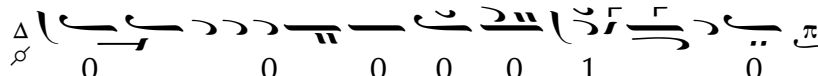


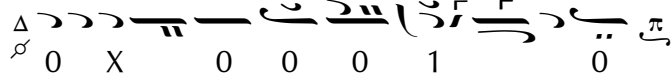


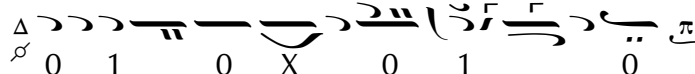
0010010X 

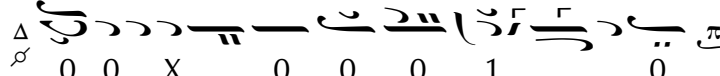
Accented on second to last syllable:

0010 


0000010 

0X00010 

010X010 

00X00010 

Accented on third to last syllable:

00X0X 

Plagal Second Mode - Sticheraric

0 X

X

10X0X

Δ 1 0 X 0 X π

X

X

100X0X

Δ 1 0 0 X 0 X π

1 X

1 X

0

100X0X

Δ 1 0 0 X 0 X π

0100100

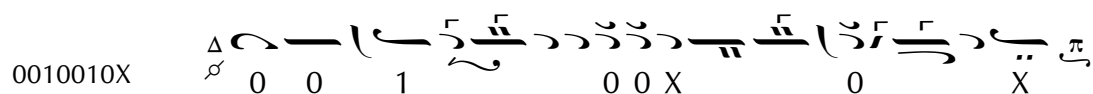
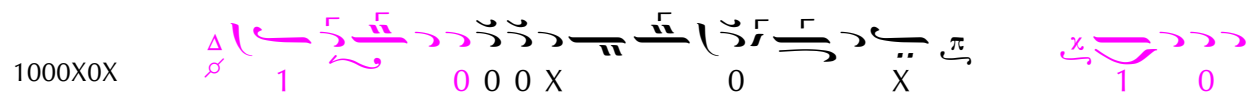
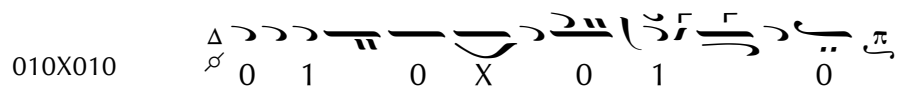
Δ 0 1 0 0 1 0 0 π

10X0X0X

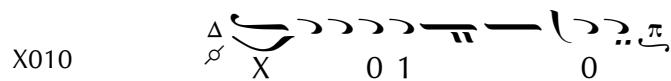
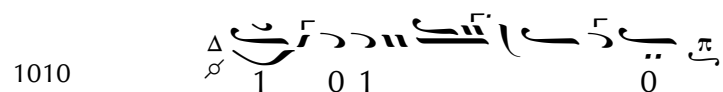
Δ 1 0 X 0 X 0 X π

X

Plagal Second Mode - Sticheric



Accented on fourth to last syllable:



Plagal Second Mode - Sticheric

0001001

1001001

0X01010

1001010

Old (Slow) Sticheraric Final Cadences:

[illegible]

0010X

Δ_{σ}

0 0 1 σ 0

π

X

P) Final Cadences for Theotokia

Accented on last syllable:

00X0X

10001

010001

Accented on second to last syllable:

00010

0010010

Accented on third to last syllable:

Plagal Second Mode - Sticheraric

X100

00101

00X0X

00100

X0100

010100

Diagram illustrating musical notation for the Plagal Second Mode - Sticheraric, showing various rhythmic patterns and their corresponding binary representations (X, 0, 1).

The notation includes various rhythmic symbols (neumes) and their corresponding binary representations (X, 0, 1) for different modes.

Examples of notation and binary representations:

- X100: X 1 0 0
- 00101: 0 0 1 0 1
- 00X0X: 0 0 X 0 X
- 00100: 0 0 1 0 0
- X0100: X 0 1 0 0
- 010100: 0 1 0 1 0 0

The diagram also shows various rhythmic patterns (neumes) and their corresponding binary representations (X, 0, 1) for different modes.

Examples of notation and binary representations:

- X100: X 1 0 0
- 00101: 0 0 1 0 1
- 00X0X: 0 0 X 0 X
- 00100: 0 0 1 0 0
- X0100: X 0 1 0 0
- 010100: 0 1 0 1 0 0

Old (Slow) Sticheric Cadences for Theotokia:

00101

00101

00101

10X0X

0 X 0

100010

BYZANTINE MUSIC FORMULAE

Plagal Second Mode - Sticheraric *"Tetraphonos" (Soft Chromatic)*

Contents*

A) Cadences on Vou.....	611
B) Cadences on Di.....	613
C) Cadences on Nee.....	616
D) Endings for Theotokia	618

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
accented or unaccented

Variations of the same formula
are indicated in color

* This list of formulae is relatively short due to the extreme rarity of this mode. The formulae herein were extracted from the only examples we found of this mode, namely: p. 283 of the Zoe *Anastasimatarion* (14th edition, 2002), p. 173 of Ephesios' *Anastasimatarion*, pp. 163-4 of Vol. I of *Mousike Kypsele*, pp. 97-99 of Ephesios' *Doxastarion*, and p. 199 of Vol. II, and on p. 88 of Stathes' *Trithekti* (a composition by Germanos of Neon Patron).

Plagal Second Mode - Tetrachonos Sticheraric (Soft Chromatic)

A) Cadences on Vou

Accented on last syllable:

01

001

0010001

Accented on second to last syllable:

From Vou

010

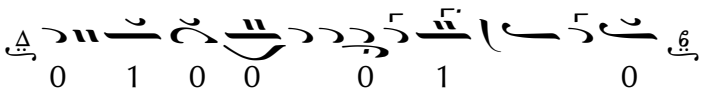
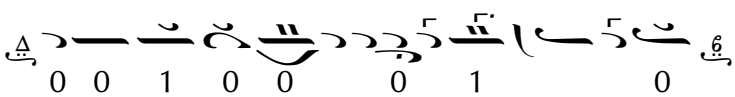
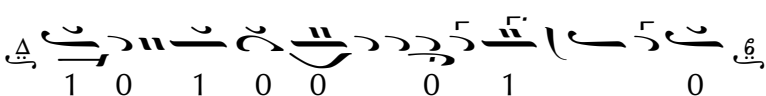
0010

From Di

10


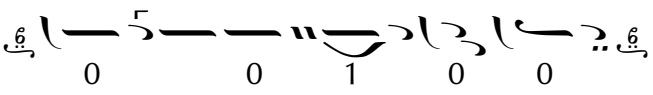

100010

Plagal Second Mode - Tetraphonos Sticheraric (Soft Chromatic)



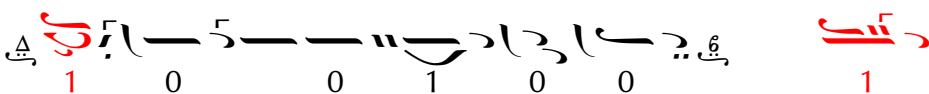
0100010	
00100010	
10100010	

Accented on third to last syllable:

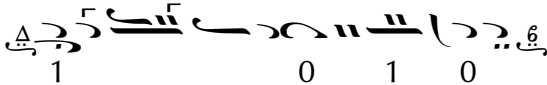

From Vou

0100	
00100	
01100	

From Di

100XXX	
	
100100	

Accented on fourth to last syllable:

1010	
01001	

Plagal Second Mode - Tetraphonos Sticheraric (Soft Chromatic)

B) Cadences on Di

Accented on last syllable:

From Vou

X0001	
10001	
010001	

From Di

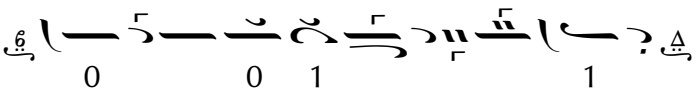
00	
000	
10001	

Accented on second to last syllable:

From Vou

010	
0010	

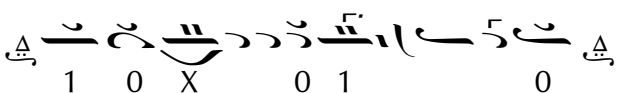
Plagal Second Mode - Tetrachonos Sticheraric (Soft Chromatic)

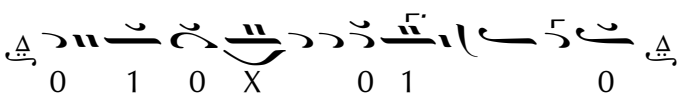
0010 

From Di

10 

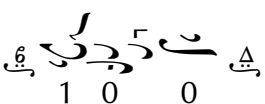
010 

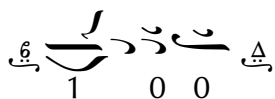
10X010 

010X010 

Accented on third to last syllable:

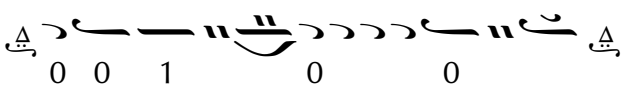
From Vou

100 



From Di

100 

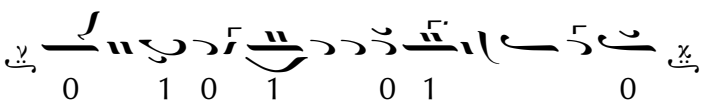
00100 

Plagal Second Mode - Tetrachonos Sticheraric (Soft Chromatic)

Accented on fourth to last syllable:

From Nee

0101010



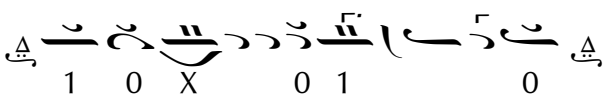
From Vou

1000

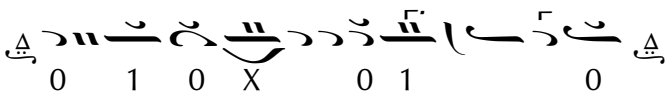


From Di

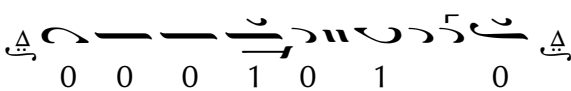
10X010



010X010



0001010



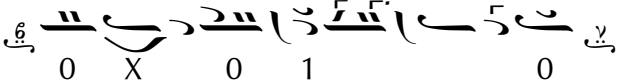
C) Cadences on Nee


Accented on last syllable:

(Use a formula ending in 100)

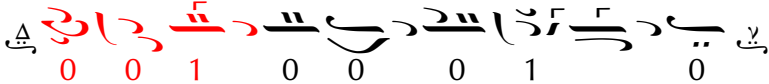
Accented on second to last syllable:

From Vou

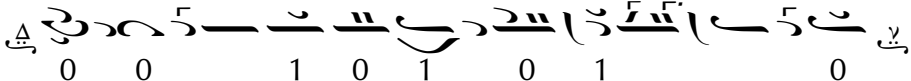
0X010 

000100010 

From Di

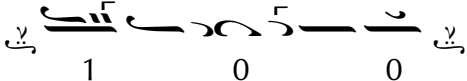
00100010 

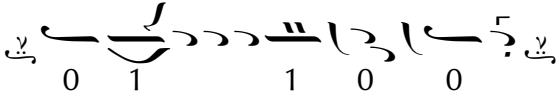


00101010 

Accented on third to last syllable:

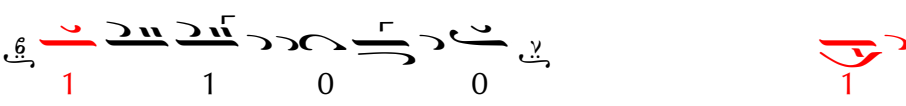

From Nee

100 

01100 

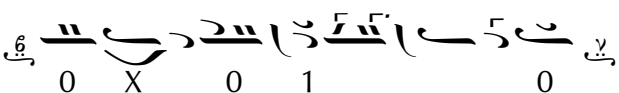
Plagal Second Mode - Tetrachonos Sticheraric (Soft Chromatic)

From Vou

1100	
10100	

Accented on fourth to last syllable:

From Vou

0X010	
-------	--

D) Endings for Theotokia

From Nee

010101100



BYZANTINE MUSIC FORMULAE

Plagal Second Mode - Heirmologic

Contents^{*}

A) Medial Cadences on Vou	620
B) Medial Cadences on Di.....	627
C) Final Cadences.....	642
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E) Endings for Theotokia	646

Key:

1 = accented syllable

0 = unaccented syllable

X = syllable that may be either
accented or unaccented

Variations of the same formula
are indicated in color

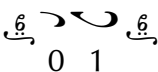
* The Byzantine music formulae herein were extracted from all the heirmologic melodies found in the Zoe Anastasimatarion (14th edition, 2002).

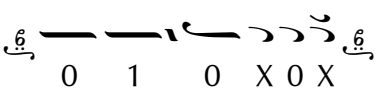
A) Medial Cadences on Vou

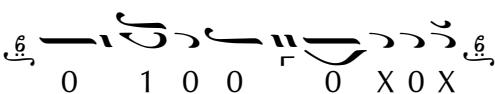
Accented on last syllable:

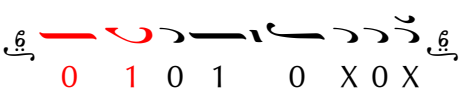
From Vou

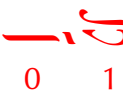
00 

01 

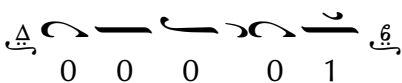
010X0X 

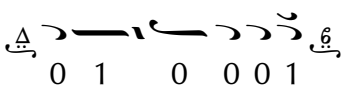
01000X0X 

01010X0X 




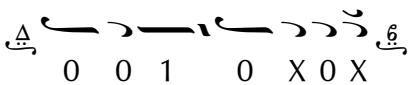
From Di

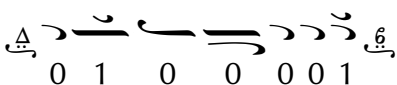
00001 

010001 

010X0X 

100001 



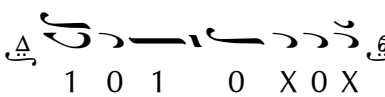
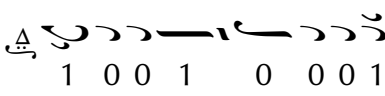
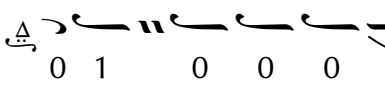
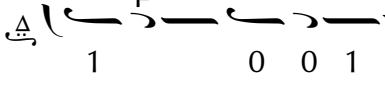
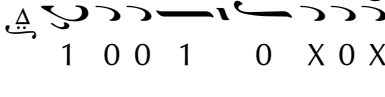
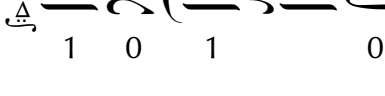
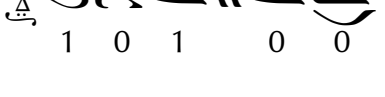

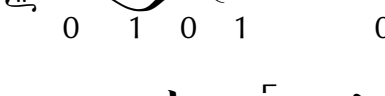
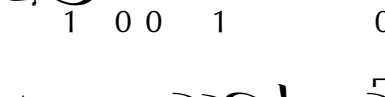
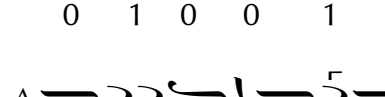
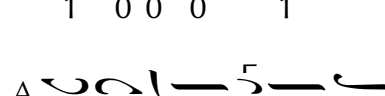

0010X0X 

0100001 

0100X0X 



Plagal Second Mode - Heirmologic (Soft Chromatic)

1000X0X		
1010X0X		
10010001		
01000X0X		
10010X0X		
		
1010010X		
10100X0X		
010000X0X		
010100X0X		
100100X0X		
0100100X0X		
1000100X0X		
1010000X0X		

Plagal Second Mode - Heirmologic (Soft Chromatic)

01010000X0X	
10000100X0X	
10010000X0X	

Accented on second to last syllable:

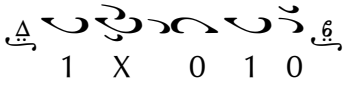
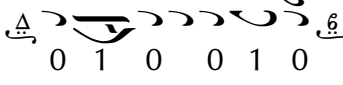



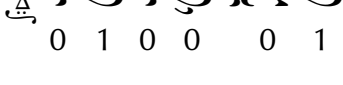
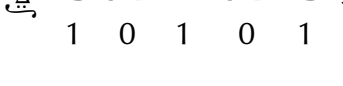
From Vou

10		
1000010		
0X010010		
01010010		

From Di

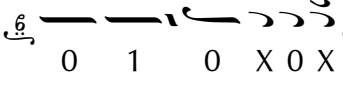
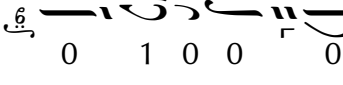
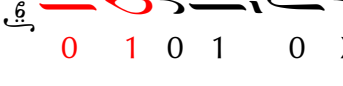
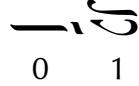
0010		
10010		

Plagal Second Mode - Heirmologic (Soft Chromatic)

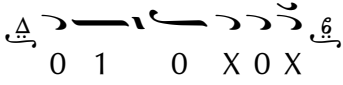
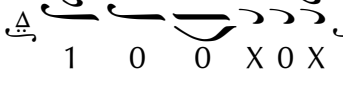
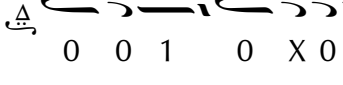
1X010		
010010		
0010010		
0100010		
		
101010010		

Accented on third to last syllable:

From Vou

010X0X		
01000X0X		
01010X0X		

From Di

010X0X		
100X0X		
0010X0X		

Plagal Second Mode - Heirmologic (Soft Chromatic)

0100100

0100X0X

1000X0X

1010X0X

10010X0X

1010010X

10100X0X

010000X0X

100100100

010100X0X

100100X0X

0100100X0X

Plagal Second Mode - Heirmologic (Soft Chromatic)

1000100X0X	
------------	--

Accented on fourth to last syllable:

From Vou

100X010

$\overset{6}{\underbrace{\quad}} \quad \underbrace{\quad} \quad \underbrace{\quad} \quad \underbrace{\quad} \quad \underbrace{\quad} \quad \underbrace{\quad} \quad \overset{6}{\underbrace{\quad}}$

1 0 0 X 0 1 0

From Di

01001		
01010		
1X010		
00010X0		

Plagal Second Mode - Heirmologic (Soft Chromatic)

1001001 Δ  1 0 0 1 0 0 1 $\underline{6}$

1001010 Δ  1 0 0 1 0 1 0 $\underline{6}$

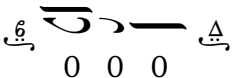
10001001 Δ  1 0 0 0 1 0 0 1 $\underline{6}$

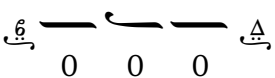
B) Medial Cadences on Di

Accented on last syllable:

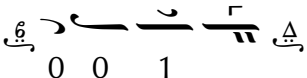
From Vou

00 


000 

01 

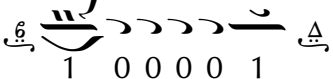
001 

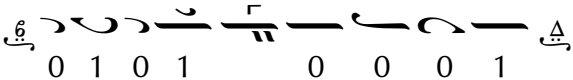
10001 


010001 

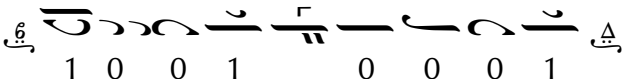
100001 

01010001 

100001 

01010001 

10010001 

10010001 

Plagal Second Mode - Heirmologic (Soft Chromatic)

001010001

0 0 1 0 1 0 0 0 1

From Di

00

0 0

000

0 0 0

0 0 0

0000

0 0 0 0

001

0 0 1

1

0001

0 0 0 1

1

0 0 0 1

10001

1 0 0 0 1

1 0 0 0 1

010001

0 1 0 0 0 1

1

0 1 0 0 0 1

1 0

100001

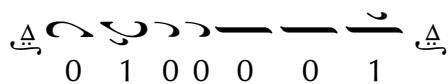
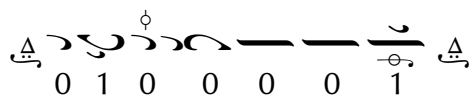
1 0 0 0 0 1

1 0

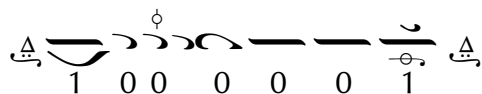
1 0

Plagal Second Mode - Heirmologic (Soft Chromatic)

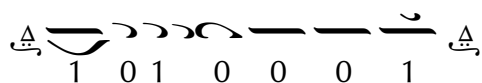
0100001



1000001



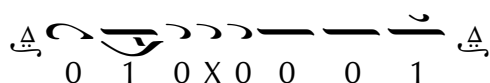
1010001



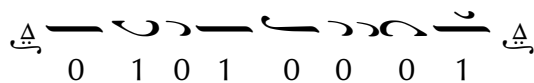
01000001



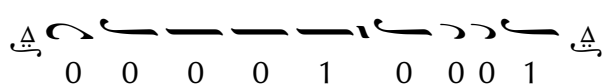
010X0001



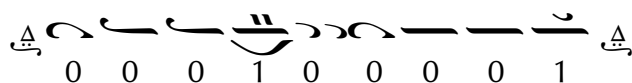
01010001



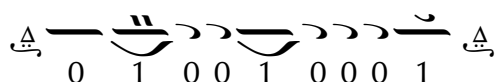
000010001



000100001



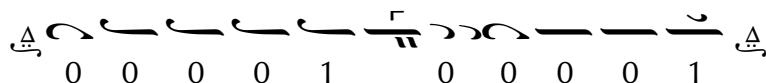
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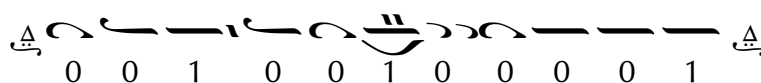
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0000100001



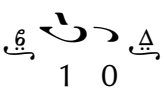
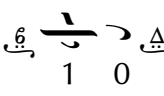
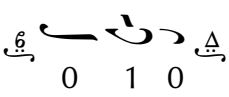
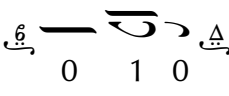
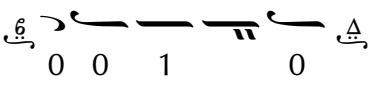
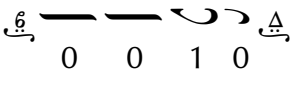
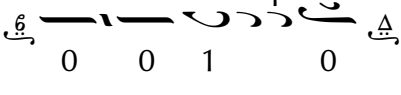
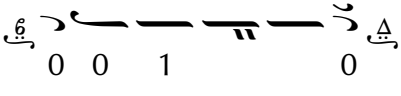
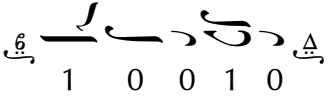
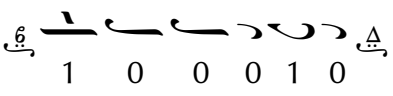
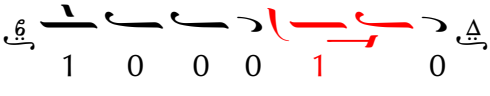
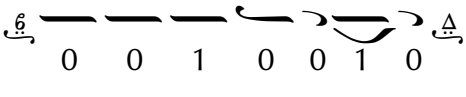
00100100001



Plagal Second Mode - Heirmologic (Soft Chromatic)

Accented on second to last syllable:

From Vou

10	
	
010	
	
0010	
	
	
	
10010	
100010	
	
0010010	



Plagal Second Mode - Heirmologic (Soft Chromatic)

0100010

1000010

00010010

00100010

010000010010

010010010010

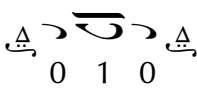
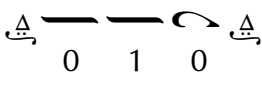
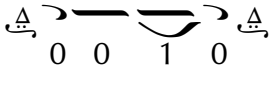
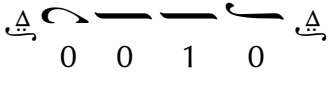
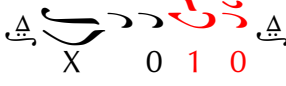

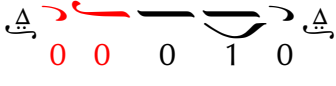
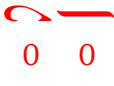
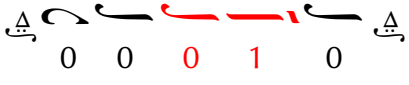
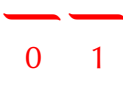
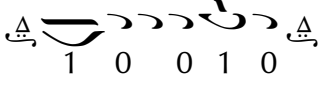
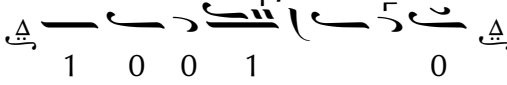
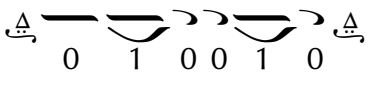
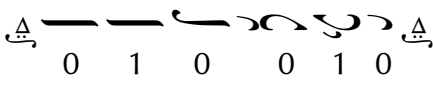
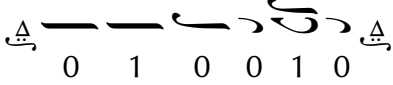
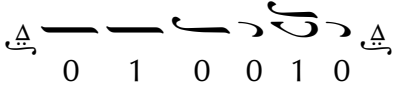
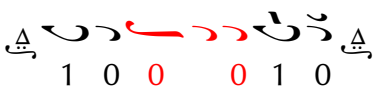

0100000010010

From Di

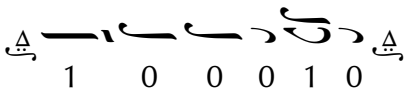
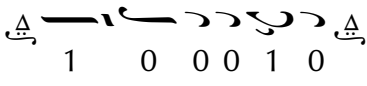
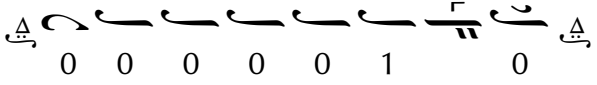


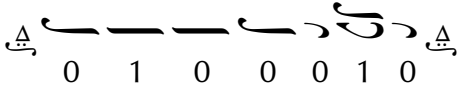
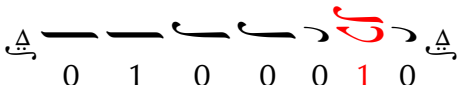

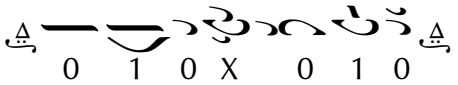
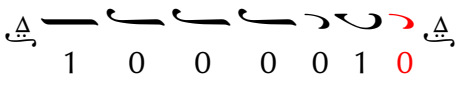

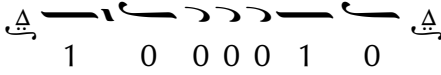
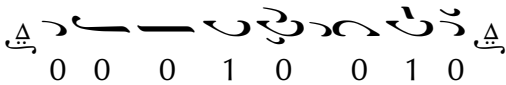
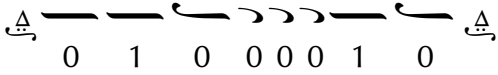
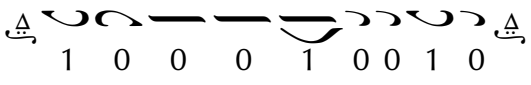
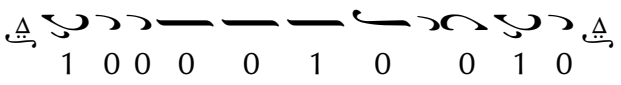
10

010

Plagal Second Mode - Heirmologic (Soft Chromatic)

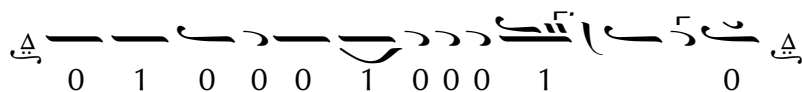
		
		
0010		
		
X010		
00010		
		
10010		
		
010010		
		
		
		
100010		

Plagal Second Mode - Heirmologic (Soft Chromatic)

		
		
0000010		
0010010		
0100010		
		
010X010		
1000010		
		
00010010		
01000010		
100010010		
1000010010		

Plagal Second Mode - Heirmologic (Soft Chromatic)

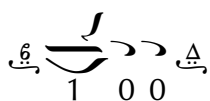
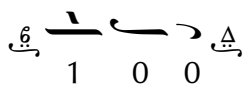
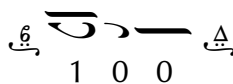
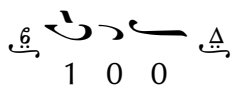
01000100010



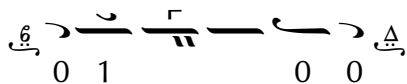
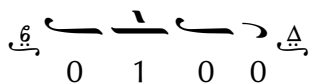
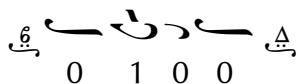
Accented on third to last syllable:

From Vou

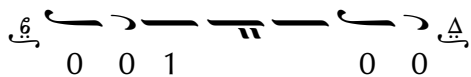
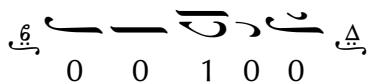
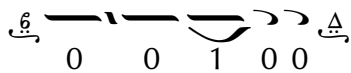
100



0100



00100



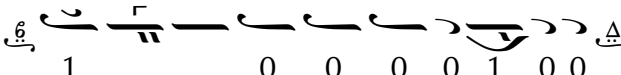
10100

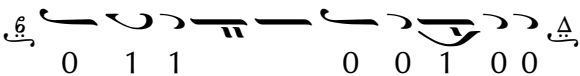


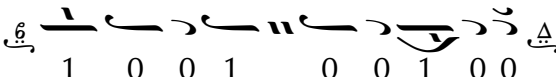
Plagal Second Mode - Heirmologic (Soft Chromatic)

010100	
100100	
X00100	
0010100	
0100100	
X000100	
1010100	
00010100	
01000100	

Plagal Second Mode - Heirmologic (Soft Chromatic)

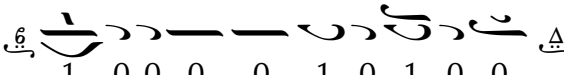
10000100


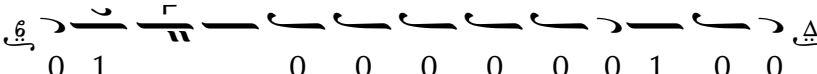
01100100


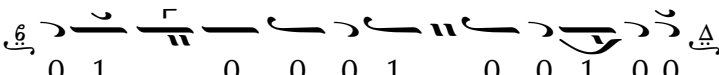
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0001000100




1000010100


01000000100


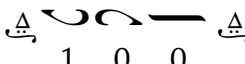
01000100100


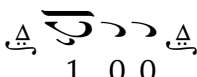
01001000100



From Di

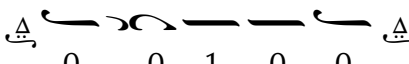
100

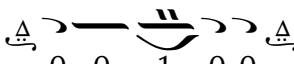


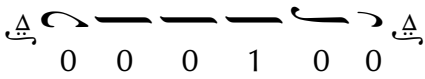




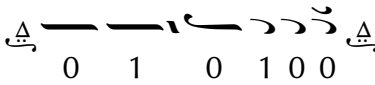
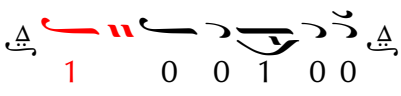

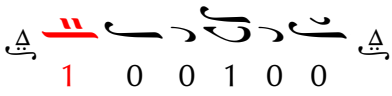


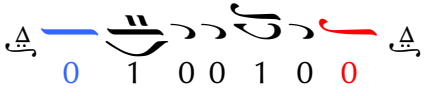


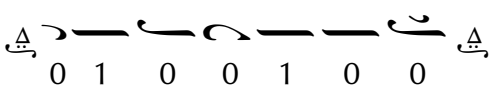
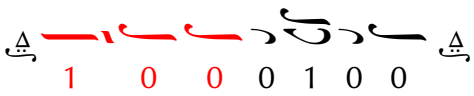
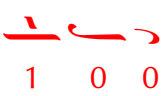
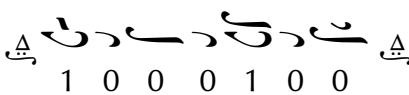
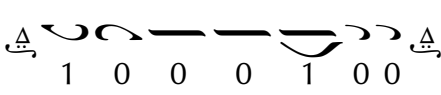


0100


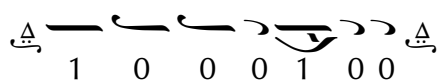
00100


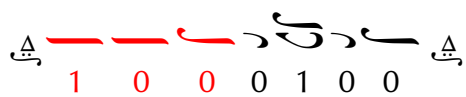


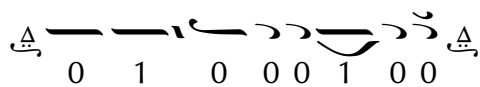
Plagal Second Mode - Heirmologic (Soft Chromatic)

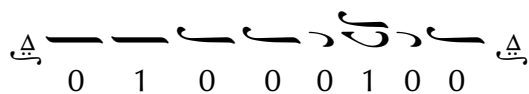
000100		
010100		
		
		
100100		
		
100110		
0100100		
		
		
		
1000100		
		
		

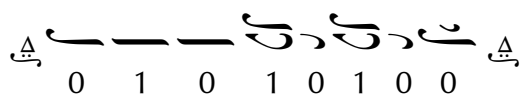
Plagal Second Mode - Heirmologic (Soft Chromatic)

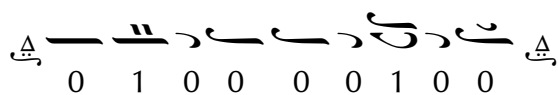


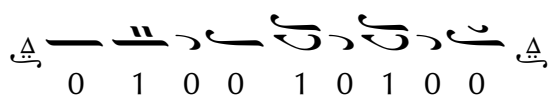


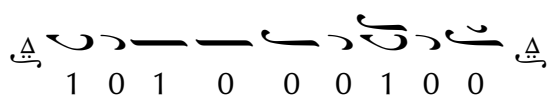
01000100 

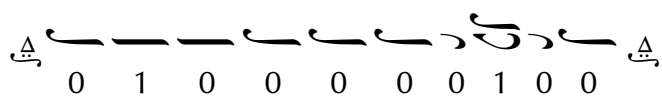


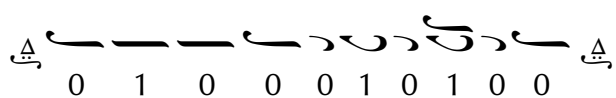
01010100 

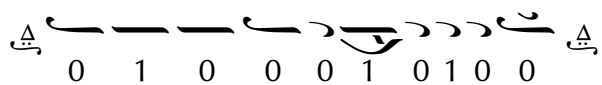
010000100 

010010100 


101000100 

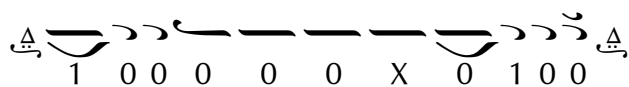
0100000100 

0100010100 



0100100100 

0101000100 

100000X0100 

Plagal Second Mode - Heirmologic (Soft Chromatic)

010001000100



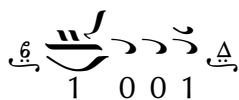
Accented on fourth to last syllable:

From Vou

1000



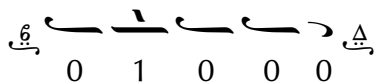
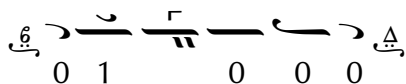
1001



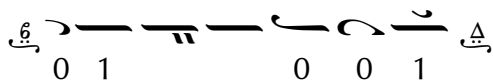
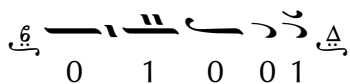
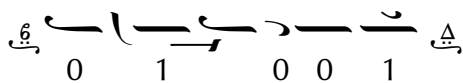
1010



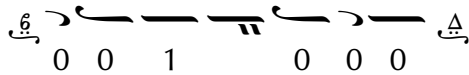
01000



01001



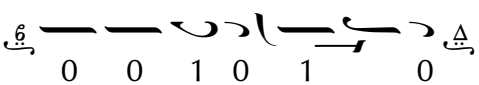
001000

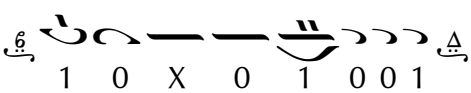


001001



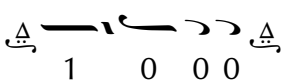
Plagal Second Mode - Heirmologic (Soft Chromatic)

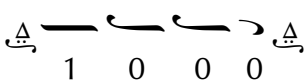
001010 


10X01001 

From Di

1000 








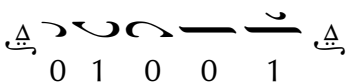
1001 

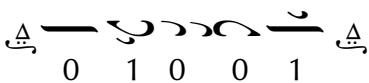
1010 

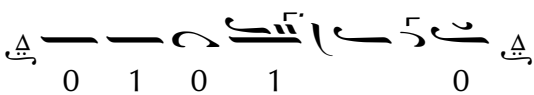
X010 



01001 





01010 

Plagal Second Mode - Heirmologic (Soft Chromatic)

101010

Δ 1 0 1 0 1 0 Δ

1 0

Δ 1 0 1 0 1 0 Δ

0101000

Δ 0 1 0 1 0 0 0 Δ

0101001

Δ 0 1 0 1 0 0 1 Δ

0101010

Δ 0 1 0 1 0 1 0 Δ

1

010X010

Δ 0 1 0 X 0 1 0 Δ

10001001

Δ 1 0 0 0 1 0 0 1 Δ

0100001010

Δ 0 1 0 0 0 0 1 0 1 0 Δ

0101001001

Δ 0 1 0 1 0 0 1 0 0 1 Δ

1000101001

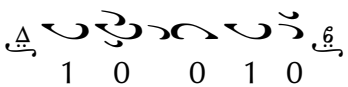
Δ 1 0 0 0 1 0 1 0 0 1 Δ

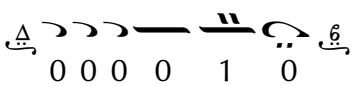
C) Final Cadences

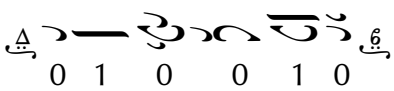
Accented on last syllable:

(Use a formula ending in 100 or 1001)

Accented on second to last syllable:

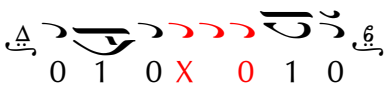
10010 

000010 

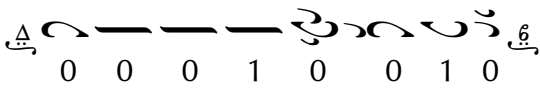
010010 

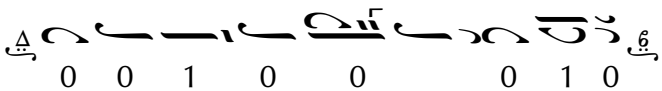
10X010 

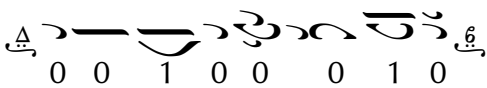


010X010 

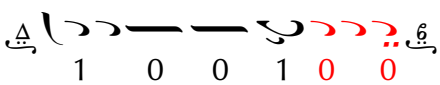


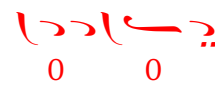
00010010 

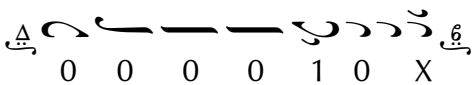
00100010 



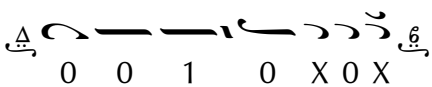
Accented on third to last syllable:

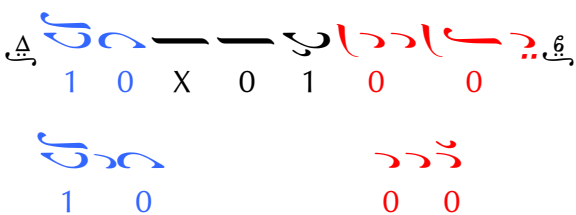
100100 

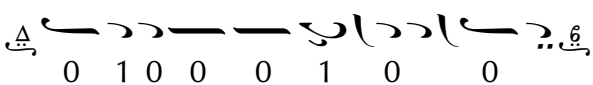


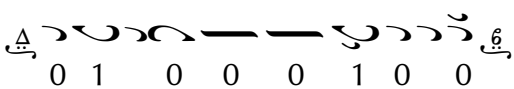
000010X 

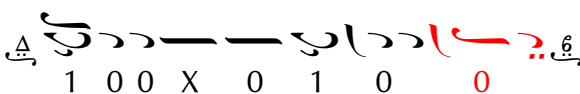

Plagal Second Mode - Heirmologic (Soft Chromatic)

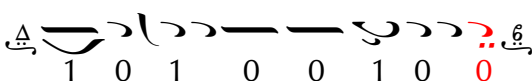

0010X0X


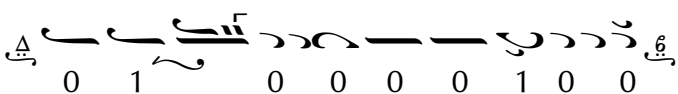
10X0100


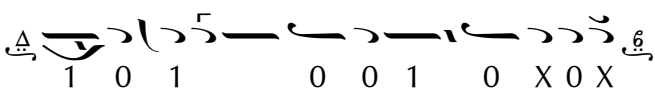
01000100


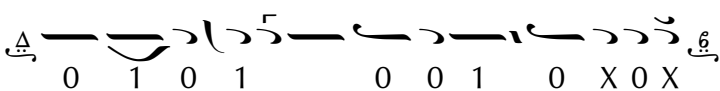
1001000


100X0100





10100100



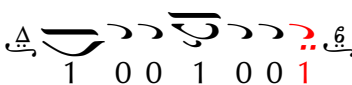

010000100




1010010X0X


01010010X0X




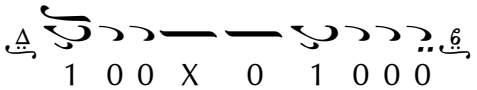
Accented on fourth to last syllable:

10X010



1001001



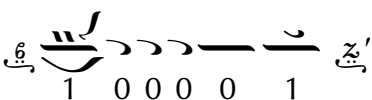
010X010



Plagal Second Mode - Heirmologic (Soft Chromatic)

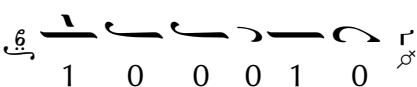
10X01010	
10101010	
100X01000	

D) Formulae with Fthoras

Accented on last syllable:


100001 

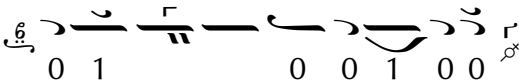
Accented on second to last syllable:

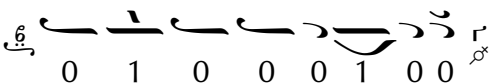
100010 

Accented on third to last syllable:

From Vou

10100 

0100100 

01000100 

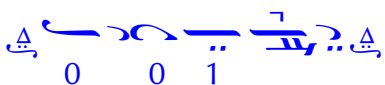
From Di

100000100 

1000100100 

E) Endings for Theotokia*

Accented on last syllable:

001 

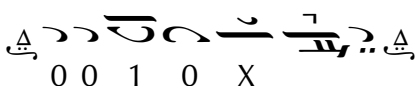
Accented on second to last syllable:


10 


00010 


Accented on third to last syllable:

100 

0010X 

10010X 

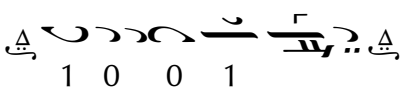
100010X 

100010X 

* The formulae in blue in this section are from the Athonite oral tradition, as represented in the book *Παρακλητική, Μουσικὸν Ἐγκόλπιον, Πλάγιοι Ἦχοι, Ἱεροθέου Ἱερομονάχου*, ἐκδόσεις Ἱ.Μ. Φιλοθέου, Ἅγιον Ὄρος, 2004.

Plagal Second Mode - Heirmologic (Soft Chromatic)

Accented on fourth to last syllable:

1001 

01001 

01010 

BYZANTINE MUSIC FORMULAE

Plagal Second Mode - Verses (Hard Chromatic)

Contents^{*}

A) Cadences on Ke	649
B) Cadences on Di.....	654
C) Cadences on Pa.....	663
D) Formulae with Fthoras	668
E) Cadences for Theotokia	669

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

* The Byzantine music formulae herein were extracted from all the verses found in the *Zoe Anastasimatarion* (14th edition, 2002), the *Anastasimatarion* of Petros Peloponnesios (Mousike Bibliothek), the *Neon Anastasimatarion* by Petros Ephesios (1820 edition), and *Mousike Pandekte* by Ioannis Lampadarios and Stephanos the 1st Domestikos (1851 edition). These formulae are applicable only to the brief verses (that are not immediately followed by troparia) of Psalms 140, 141, and 129 chanted in the beginning of Vespers immediately after "Lord I Have Cried"; the brief verses of Psalms 148, 149, and 150 chanted in Orthros immediately after "Let Every Breath"; and the hard chromatic doxology from Pa.

Plagal Second Mode - Verses (Hard Chromatic)

A) Cadences on Ke

Accented on last syllable:

From Pa

1	$\pi \overbrace{1}^{\text{f}} \text{z}$
01	$\pi \overbrace{0}^{\text{f}} \overbrace{1}^{\text{f}} \text{z}$
001	$\pi \overbrace{0}^{\text{f}} \overbrace{0}^{\text{f}} \overbrace{1}^{\text{f}} \text{z}$
00010001	$\pi \overbrace{0}^{\text{f}} \overbrace{0}^{\text{f}} \overbrace{0}^{\text{f}} \overbrace{1}^{\text{f}} \overbrace{0}^{\text{f}} \overbrace{0}^{\text{f}} \overbrace{0}^{\text{f}} \overbrace{1}^{\text{f}} \text{z}$

From Di

0001	$\Delta \overbrace{0}^{\text{f}} \overbrace{0}^{\text{f}} \overbrace{0}^{\text{f}} \overbrace{1}^{\text{f}} \text{z}$
10X0001	$\Delta \overbrace{1}^{\text{f}} \overbrace{0}^{\text{f}} \overbrace{X}^{\text{f}} \overbrace{0}^{\text{f}} \overbrace{0}^{\text{f}} \overbrace{0}^{\text{f}} \overbrace{1}^{\text{f}} \text{z}$

From Ke

00	$\text{z} \overbrace{0}^{\text{f}} \overbrace{0}^{\text{f}} \text{z}$
00000	$\text{z} \overbrace{0}^{\text{f}} \overbrace{0}^{\text{f}} \overbrace{0}^{\text{f}} \overbrace{0}^{\text{f}} \overbrace{0}^{\text{f}} \text{z}$

Accented on second to last syllable:

From Pa

10	$\pi \overbrace{1}^{\text{f}} \overbrace{0}^{\text{f}} \text{z}$
----	--

Plagal Second Mode - Verses (Hard Chromatic)

	$\pi \overbrace{1}^{\frown} \overbrace{0}^{\smile} \chi$
010	$\pi \overbrace{0}^{\frown} \overbrace{1}^{\smile} \overbrace{0}^{\frown} \chi$
0010	$\pi \overbrace{0}^{\frown} \overbrace{0}^{\frown} \overbrace{1}^{\smile} \overbrace{0}^{\smile} \chi$
	$\pi \overbrace{0}^{\frown} \overbrace{0}^{\frown} \overbrace{1}^{\frown} \overbrace{0}^{\frown} \chi$
X010	$\pi \overbrace{X}^{\frown} \overbrace{0}^{\frown} \overbrace{1}^{\frown} \overbrace{0}^{\frown} \chi$
X0010	$\pi \overbrace{X}^{\frown} \overbrace{0}^{\smile} \overbrace{0}^{\frown} \overbrace{1}^{\smile} \overbrace{0}^{\smile} \chi$
0010010	$\pi \overbrace{0}^{\frown} \overbrace{0}^{\frown} \overbrace{1}^{\smile} \overbrace{0}^{\smile} \overbrace{0}^{\frown} \overbrace{1}^{\frown} \overbrace{0}^{\frown} \chi$
10100010	$\pi \overbrace{1}^{\frown} \overbrace{0}^{\smile} \overbrace{1}^{\smile} \overbrace{0}^{\smile} \overbrace{0}^{\frown} \overbrace{0}^{\frown} \overbrace{1}^{\frown} \overbrace{0}^{\frown} \chi$
000100010	$\pi \overbrace{0}^{\frown} \overbrace{0}^{\frown} \overbrace{0}^{\frown} \overbrace{1}^{\smile} \overbrace{0}^{\smile} \overbrace{0}^{\frown} \overbrace{0}^{\frown} \overbrace{1}^{\frown} \overbrace{0}^{\frown} \chi$

From Di

0010	$\Delta \overbrace{0}^{\smile} \overbrace{0}^{\frown} \overbrace{1}^{\smile} \overbrace{0}^{\smile} \chi$	$\overbrace{0}^{\smile} \chi$
	$\Delta \overbrace{0}^{\smile} \overbrace{0}^{\frown} \overbrace{1}^{\frown} \overbrace{0}^{\frown} \chi$	

From Ke

100010	$\chi \overbrace{1}^{\smile} \overbrace{0}^{\smile} \overbrace{0}^{\frown} \overbrace{0}^{\frown} \overbrace{1}^{\frown} \overbrace{0}^{\frown} \chi$
010X010	$\chi \overbrace{0}^{\smile} \overbrace{1}^{\smile} \overbrace{0}^{\smile} \overbrace{X}^{\smile} \overbrace{0}^{\frown} \overbrace{1}^{\frown} \overbrace{0}^{\frown} \chi$

Plagal Second Mode - Verses (Hard Chromatic)

Accented on third to last syllable:

From Pa

100	
0100	
00100	
X0100	
100100	
101000100	

From Di

00100		
100100		
1000100		

Plagal Second Mode - Verses (Hard Chromatic)

From Ke

100	$\begin{array}{c} \text{z} \text{---} \text{z} \text{---} \text{z} \\ 1 \quad 0 \quad 0 \end{array}$
	$\begin{array}{c} \text{z} \text{---} \text{z} \text{---} \text{z} \\ 1 \quad 0 \quad 0 \end{array}$
0100	$\begin{array}{c} \text{z} \text{---} \text{z} \text{---} \text{z} \text{---} \text{z} \\ 0 \quad 1 \quad 0 \quad 0 \end{array}$
1000100	$\begin{array}{c} \text{z} \text{---} \text{z} \text{---} \text{z} \text{---} \text{z} \text{---} \text{z} \text{---} \text{z} \\ 1 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$

Accented on fourth to last syllable:

From Pa

X010	$\begin{array}{c} \pi \text{---} \text{z} \text{---} \text{z} \text{---} \text{z} \\ X \quad 0 \quad 1 \quad 0 \end{array}$
1001	$\begin{array}{c} \pi \text{---} \text{z} \text{---} \text{z} \text{---} \text{z} \\ 1 \quad 0 \quad 0 \quad 1 \end{array}$
01001	$\begin{array}{c} \pi \text{---} \text{z} \text{---} \text{z} \text{---} \text{z} \text{---} \text{z} \\ 0 \quad 1 \quad 0 \quad 0 \quad 1 \end{array}$
001001	$\begin{array}{c} \pi \text{---} \text{z} \text{---} \text{z} \text{---} \text{z} \text{---} \text{z} \text{---} \text{z} \\ 0 \quad 0 \quad 1 \quad 0 \quad 0 \quad 1 \end{array}$

From Di

1001	$\begin{array}{c} \Delta \text{---} \text{z} \text{---} \text{z} \text{---} \text{z} \\ 1 \quad 0 \quad 0 \quad 1 \end{array}$
01001	$\begin{array}{c} \Delta \text{---} \text{z} \text{---} \text{z} \text{---} \text{z} \text{---} \text{z} \\ 0 \quad 1 \quad 0 \quad 0 \quad 1 \end{array}$

From Ke

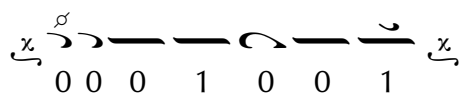
1001	$\begin{array}{c} \text{z} \text{---} \text{z} \text{---} \text{z} \text{---} \text{z} \\ 1 \quad 0 \quad 0 \quad 1 \end{array}$
------	--

Plagal Second Mode - Verses (Hard Chromatic)

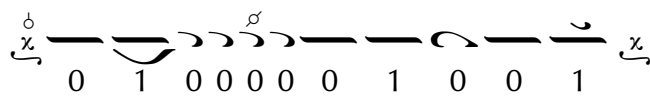
01010



0001001



01000001001

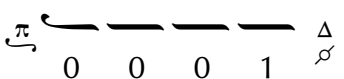


Plagal Second Mode - Verses (Hard Chromatic)

B) Cadences on Di

Accented on last syllable:

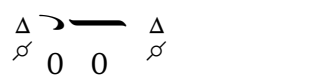
From Pa

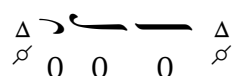
0001 

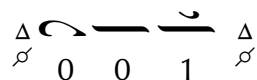
100001 

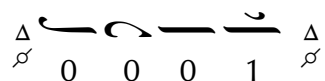


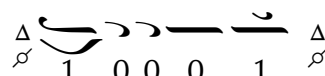
From Di

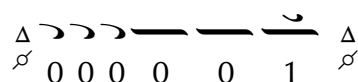
00 

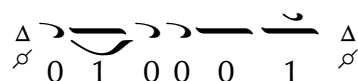
000 

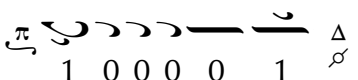
001 

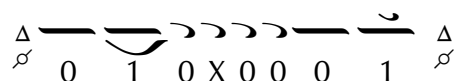
0001 

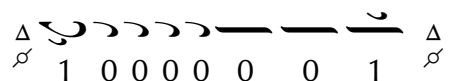
10001 

000001 

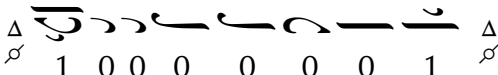
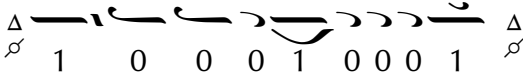
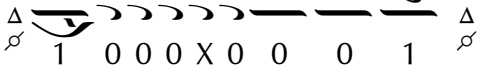

010001 

100001 

010X0001 

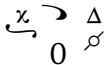
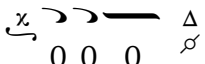
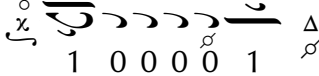
10000001 

Plagal Second Mode - Verses (Hard Chromatic)

	Δ 
	1 0 0 0 0 0 0 1
100010001	Δ 
	1 0 0 0 1 0 0 0 1
1000X0001	Δ 
	1 0 0 0 X 0 0 0 1
1010100001	Δ 
	1 0 1 0 1 0 0 0 0 1

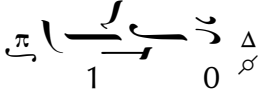
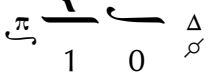
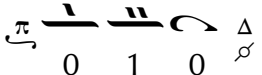
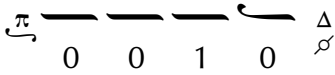


From Ke

0	Δ 
	0
000	Δ 
	0 0 0
100001	Δ 
	1 0 0 0 0 1

Accented on second to last syllable:

From Pa

10	Δ 
	1 0
	Δ 
	1 0
010	Δ 
	0 1 0
0010	Δ 
	0 0 1 0

From Di

Plagal Second Mode - Verses (Hard Chromatic)

10		
0010		
000010		
010010		
0010010		
000X010		
0100010		
100X010		
0100X010		
<u>From Ke</u>		
100010		

Plagal Second Mode - Verses (Hard Chromatic)

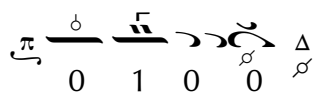
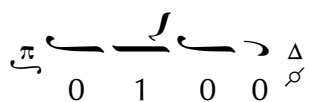
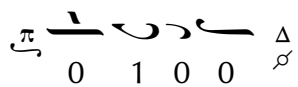
110010		
0100010		
01000010		
10000010		

Accented on third to last syllable:

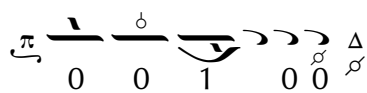
From Pa

100		
0100		

Plagal Second Mode - Verses (Hard Chromatic)

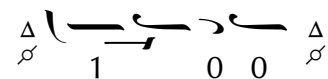
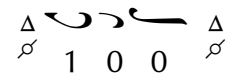
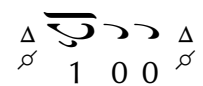
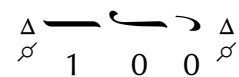
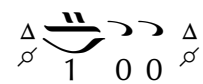
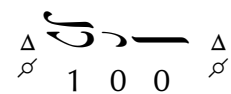


00100




From Di

100

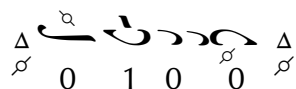


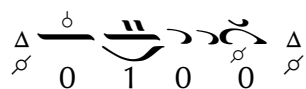
Plagal Second Mode - Verses (Hard Chromatic)

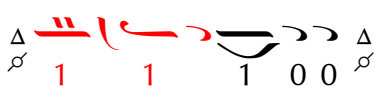
0100 

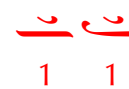


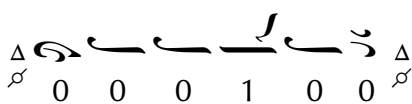


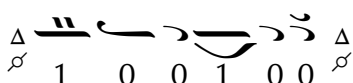


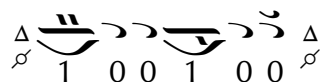


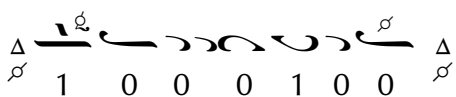
11100 

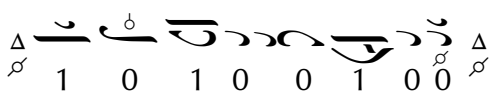


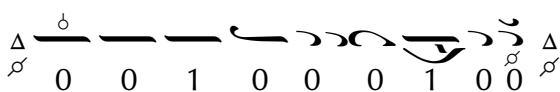
000100 

100100 





1000100 

10100100 



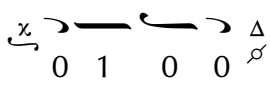

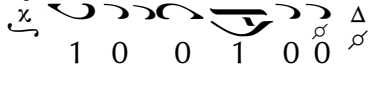



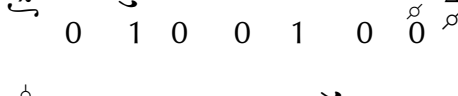
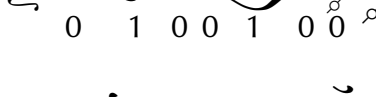
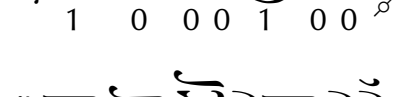
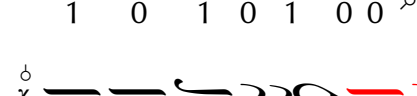


001000100 

From Ke

100 



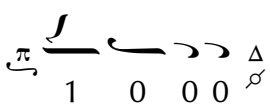
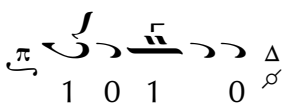
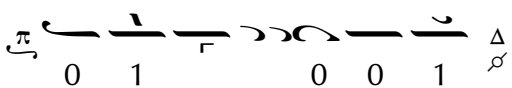
Plagal Second Mode - Verses (Hard Chromatic)

		
0100		
		
10100		
100100		
		
1X0100		
0100100		
		
1000100		
1010100		
01000100		

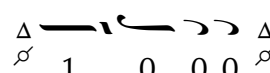
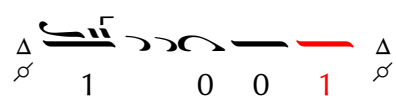
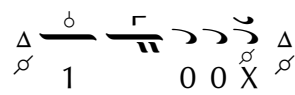
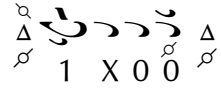

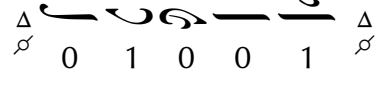
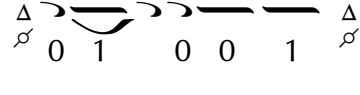
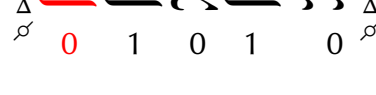
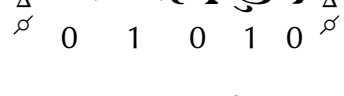

Accented on fourth to last syllable:

From Pa

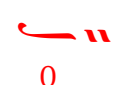
Plagal Second Mode - Verses (Hard Chromatic)

1000	
1010	
01001	

From Di

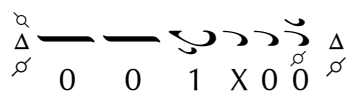
1000	
1001	
100X	
1X00	
01000	
01001	
	
01010	
	
	



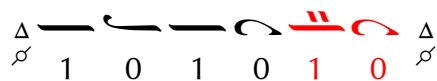


Plagal Second Mode - Verses (Hard Chromatic)

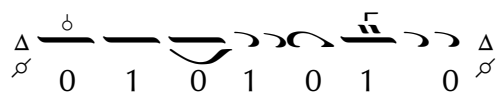
001X00



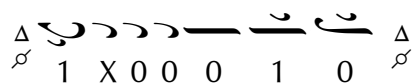
101010



0101010

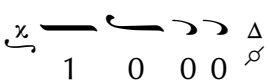


1X00010

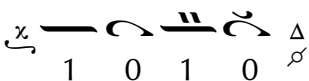


From Ke

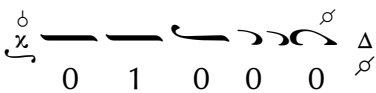
1000



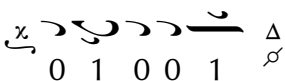
1010



01000



01001



0101010



Plagal Second Mode - Verses (Hard Chromatic)

C) Cadences on Pa

The formulae in this section that are not from Pa are used as final formulae.

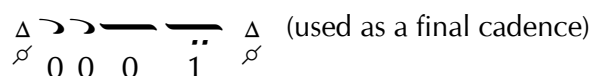
Accented on last syllable:

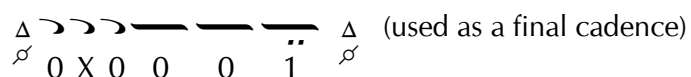
From Pa

00 

0100100001  

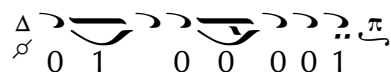
From Di


0001  (used as a final cadence)

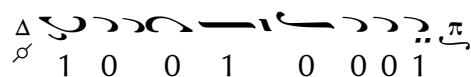
0X0001  (used as a final cadence)

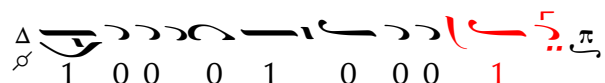

0010001  

0100001 



01000001  (used as a final cadence)

10010001 

100010001  

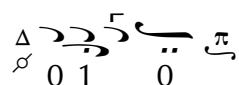
Plagal Second Mode - Verses (Hard Chromatic)

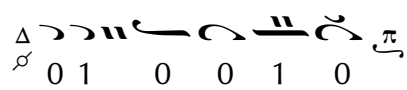
Accented on second to last syllable:

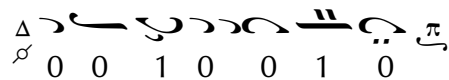
From Pa

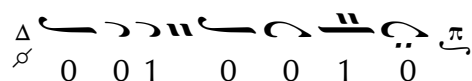
10 


From Di


010 

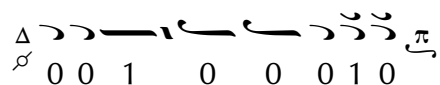
010010 

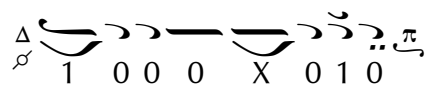
0010010 



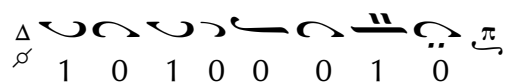
100X010 


00010010 

00100010 

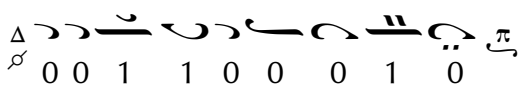
1000X010 



10010010 

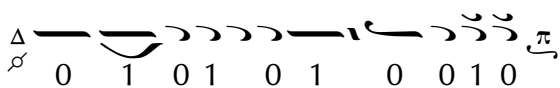
10100010 

10X00010 

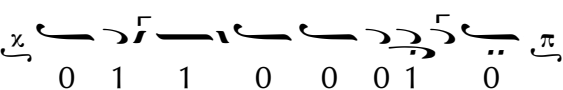
Plagal Second Mode - Verses (Hard Chromatic)

001100010 

100100010  

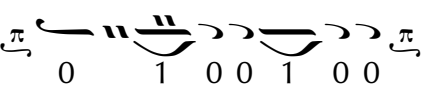
0101010010 

From Ke

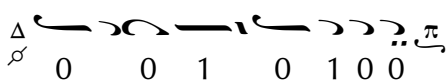
01100010 

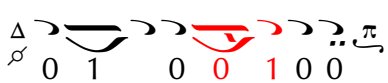
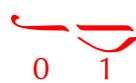
Accented on third to last syllable:

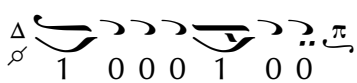
From Pa


0100100 

From Di


0010100 

0100100  

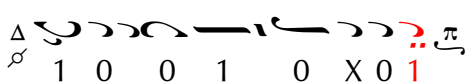

1000100 

1100100 

01000100 

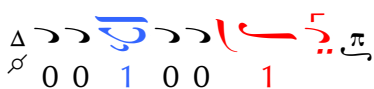
10000100 

Plagal Second Mode - Verses (Hard Chromatic)


10010X01  


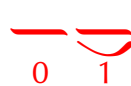
Accented on fourth to last syllable:

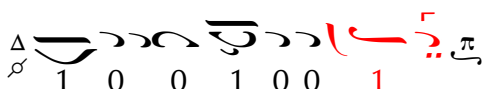

From Di

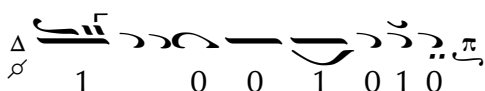
001001 


0101010 

0001010  

1001001  

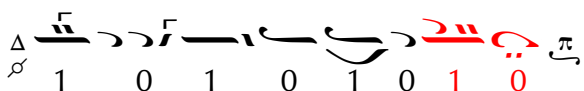

1001010 



0001010 

1010010 

01X0X010 

10101010  

Plagal Second Mode - Verses (Hard Chromatic)

10001010	Δ ρ 1 0 0 0 1 0 1 0 π	0 1
010001001	Δ ρ 0 1 0 0 0 1 0 0 1 π	
100001010	Δ ρ 1 0 0 0 0 1 0 1 0 π	1 0 1 0
010X001010	Δ ρ 0 1 0 X 0 0 1 0 1 0 π	X 0

Plagal Second Mode - Verses (Hard Chromatic)

D) Formulae with Fthoras

010 π 0 1 0 γ ϕ

0100X010

0 1 0 0 X 0 1 0

Plagal Second Mode - Verses (Hard Chromatic)

E) Cadences for Theotokia

From Di

Δ

OX0100

δ 0 X 0 1 0 0 δ

0010100



Grave Mode



BYZANTINE MUSIC FORMULAE

Grave Mode - Sticheraric

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* The Byzantine music formulae herein were extracted from sticheraric melodies found in the *Zoe Anastas74 imatarion* (14th edition, 2002) Volumes I, II, and III of *Mousike Kypsele* (1883 edition), the *Doxastarion* of Konstantinos Protopsaltis (1844 edition), and the two-volume *Athonias* (1906 edition) by Petros Philanthidis.

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula are
indicated in color

Medial Cadences on Pa

A) Accented on Last Syllable

Notice that this mode has no medial cadences on Pa for phrases accented on the last syllable. In the event that a composer desires to have a cadence on Pa for a phrase accented on the last syllable, he may use a formula ending in the pattern "100".

Pa - Pa

This section is essentially empty, since such melodic movements in this mode are rare.

00 $\pi \overline{\eta} \quad \overline{\eta} \quad \pi \overline{\eta}$
 0 0

Ga - Pa

00 $\pi \overline{\eta} \quad \overline{\eta} \quad \pi \overline{\eta}$
 0 0

Di - Pa

00 $\Delta \overline{\eta} \quad \overline{\eta} \quad \pi \overline{\eta}$
 0 0

B) Accented on Second to Last Syllable

Pa - Pa

This section is almost empty, since such melodic movements in this mode are rare.

00010 π_q

Ga - Pa
$$00010 \quad \begin{array}{ccccc} \text{r} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \pi \\ \text{q} & 0 & 0 & 0 & 1 & 0 & \text{q} \end{array}$$

010010 π_q

100010 π^q

Di - Pa

10

$\overset{\Delta}{\partial} \underset{1}{\sim} \underset{0}{\sim} \pi_q$

010 Δ
d_A 0 1 ̄ ̄ π_q
 0

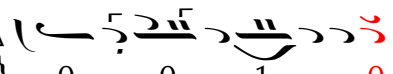
$$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}} \underset{0}{\text{—}} \underset{1}{\text{—}} \underset{\sim}{\text{—}} \underset{\text{—}}{\text{—}} \underset{0}{\text{—}} \underset{?}{\text{—}} \underset{\pi}{\text{—}} \underset{q}{\text{—}}$$
$$\begin{array}{ccccccc} \Delta & & & & & & \\ \delta & \hookrightarrow & \hookrightarrow & \hookrightarrow & \hookrightarrow & \hookrightarrow & \pi \\ 0 & & 1 & & 0 & & q \end{array}$$


0

0

$$\begin{matrix} 5 & 1 \\ 0 \end{matrix}$$

0010


$\overset{\Delta}{\mathfrak{A}}$  $\overset{\pi}{\mathfrak{q}}$
0 0 1 0

$\overset{\Delta}{\mathfrak{A}}$  $\overset{\pi}{\mathfrak{q}}$
0 0 1 0

 0

 0

 0

 0

00010

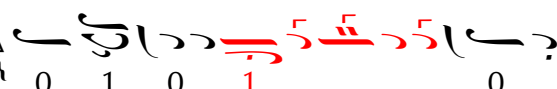
$\overset{\Delta}{\mathfrak{A}}$  $\overset{\pi}{\mathfrak{q}}$
0 0 0 1 0

 0

 0

 0

01010

$\overset{\Delta}{\mathfrak{A}}$  $\overset{\pi}{\mathfrak{q}}$
0 1 0 1 0

 1

C) Accented on Third to Last Syllable

Pa - Pa

This section is empty, since such melodic movements in this mode are rare.

Ga - Pa

This section is also empty because melodies in this mode rarely move directly from Ga to Pa.

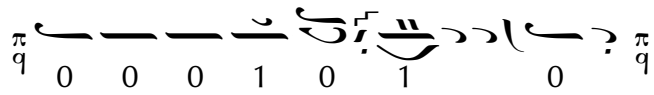
Di - Pa

100		
0100		
010X		
1100		
00100		

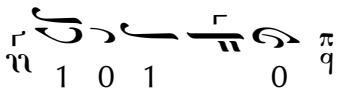
D) Accented on Fourth to Last Syllable

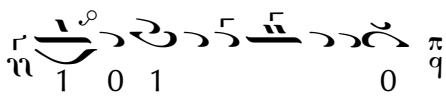
Pa - Pa

This section is almost empty, since such melodic movements in this mode are rare.

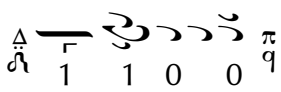
0001010 

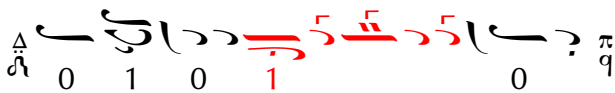
Ga - Pa

1010 



Di - Pa

1100 

01010 



Medial Cadences on Ga

E) Accented on Last Syllable

Pa - Ga

01	$\pi \begin{array}{c} \text{—} \\ \text{q} \\ 0 \end{array} \rightarrow \begin{array}{c} \text{—} \\ 1 \\ \text{—} \end{array} \text{—} \text{—}$
0001	$\pi \begin{array}{c} \text{—} \\ \text{q} \\ 0 \end{array} \text{—} \text{—} \text{—} \text{—} \begin{array}{c} \text{—} \\ 0 \\ \text{—} \end{array} \begin{array}{c} \text{—} \\ 0 \\ \text{—} \end{array} \rightarrow \begin{array}{c} \text{—} \\ 1 \\ \text{—} \end{array} \text{—} \text{—}$
01001	$\pi \begin{array}{c} \text{—} \\ \text{q} \\ 0 \end{array} \text{—} \begin{array}{c} \text{—} \\ 1 \\ \text{—} \end{array} \rightarrow \begin{array}{c} \text{—} \\ 0 \\ \text{—} \end{array} \begin{array}{c} \text{—} \\ 0 \\ \text{—} \end{array} \rightarrow \begin{array}{c} \text{—} \\ 1 \\ \text{—} \end{array} \text{—} \text{—}$
	$\pi \begin{array}{c} \text{—} \\ \text{q} \\ 0 \end{array} \begin{array}{c} \text{—} \\ 1 \\ \text{—} \end{array} \text{—} \begin{array}{c} \text{—} \\ 0 \\ \text{—} \end{array} \begin{array}{c} \text{—} \\ 0 \\ \text{—} \end{array} \rightarrow \begin{array}{c} \text{—} \\ 1 \\ \text{—} \end{array} \text{—} \text{—}$
100001	$\pi \begin{array}{c} \text{—} \\ \text{q} \\ 1 \end{array} \text{—} \begin{array}{c} \text{—} \\ 0 \\ \text{—} \end{array} \begin{array}{c} \text{—} \\ 0 \\ \text{—} \end{array} \rightarrow \begin{array}{c} \text{—} \\ 0 \\ \text{—} \end{array} \begin{array}{c} \text{—} \\ 0 \\ \text{—} \end{array} \rightarrow \begin{array}{c} \text{—} \\ 1 \\ \text{—} \end{array} \text{—} \text{—}$

Ga - Ga

000	$\text{—} \text{—} \text{—} \text{—}$
X0X0X	$\text{—} \text{—} \text{—} \text{—} \text{—} \text{—}$
1X0XX	$\text{—} \text{—} \text{—} \text{—} \text{—} \text{—}$
101001	$\text{—} \text{—} \text{—} \text{—} \text{—} \text{—}$
	$\text{—} \text{—} \text{—} \text{—} \text{—} \text{—}$
1X0X0X	$\text{—} \text{—} \text{—} \text{—} \text{—} \text{—}$
001X0X0X	$\text{—} \text{—} \text{—} \text{—} \text{—} \text{—}$

Grave Mode - Sticheraric

0001X0X0X

101010X0X0X

Di - Ga

0

00

000

1001

001001

X01001

010001

Grave Mode - Sticheraric

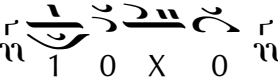

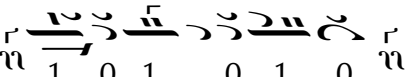
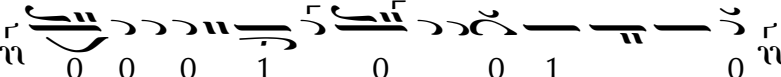
100X01	$\overset{\Delta}{\mathfrak{A}}$	
0001001	$\overset{\Delta}{\mathfrak{A}}$	
0101001	$\overset{\Delta}{\mathfrak{A}}$	
X0X0X0X	$\overset{\Delta}{\mathfrak{A}}$	
0100001	$\overset{\Delta}{\mathfrak{A}}$	
	$\overset{\Delta}{\mathfrak{A}}$	
01001001	$\overset{\Delta}{\mathfrak{A}}$	
10001001	$\overset{\Delta}{\mathfrak{A}}$	
	$\overset{\Delta}{\mathfrak{A}}$	
10010001	$\overset{\Delta}{\mathfrak{A}}$	
	$\overset{\Delta}{\mathfrak{A}}$	
0001010X	$\overset{\Delta}{\mathfrak{A}}$	

F) Accented on Second to Last Syllable

Pa - Ga

010	π q		0	1	0	π						
0100010	π q		0	1	0	0	0	0	1	0	π	
000100010	π q		0	0	0	1	0	0	0	1	0	π

Ga - Ga

10X0	
1X0XX	
101010	
00010010	

Di - Ga

10010	Δ π		1	0	0	1	0	π		
			0	0	0	0	0	π		
010010	Δ π		0	1	0	0	1	0	π	
100010	Δ π		1	0	0	0	1	0	π	
0010010	Δ π		0	0	1	0	0	1	0	π

Grave Mode - Sticheraric

Δ
 δ 0 0 1 0 0 1 0 0

Δ
 δ 0 0 1 0 0 1 0

1 0 0 0

1 0 0 0

1 0 0

0 0

0100010

Δ
 δ 0 1 0 0 0 1 0

0 0 0

Δ
 δ 0 1 0 0 0 1 0 0

1000010

Δ
 δ 1 0 0 0 0 1 0

0 0

1010010

Δ
 δ 1 0 1 0 0 1 0 1 0


Δ
 δ 1 0 1 0 0 1 0


Δ
 δ 1 0 1 0 0 1 0

Grave Mode - Sticheraric

10X0010		
1001010		
00010010		
00100010		
01001010		
01010010		
X0XX0010		
01000010		

Grave Mode - Sticheraric

010000010 

010001010 $\overset{\Delta}{\mathcal{A}}$  \mathcal{A}

101000010 Δ 1 0 1 0 0 0 1 0 ∇

Diagram illustrating the decomposition of the tensor product of two adjoint representations of $SU(3)$ into irreducible representations:


$$8 \otimes 8 = 1 \oplus 8_S \oplus 8_A \oplus 10 \oplus 10^* \oplus 27$$

$$8_S \otimes 8_S = 1 \oplus 8_S \oplus 27$$

$$8_A \otimes 8_A = 8_A \oplus 27$$

0 0 0

100000010 $\frac{A}{a}$ 1 0 0 0 0 0 0 1 0 $\frac{r}{n}$

0100000010 

G) Accented on Third to Last Syllable

Pa - Ga

0001X0X

010X0100

00100100

Ga - Ga

X0X0X

00100

1X0X0X

001X0X0X

0001X0X0X

101010X0X0X

Di -Ga

0100

00100

Grave Mode - Sticheraric

$\overset{\Delta}{\mathcal{A}} \begin{array}{c} \text{Diagram 1} \\ 0 \quad 0 \quad 1 \quad 0 \quad \text{hook} \quad 0 \quad \text{hook} \end{array}$
 $\overset{\Delta}{\mathcal{A}} \begin{array}{c} \text{Diagram 2} \\ 0 \quad 0 \quad 1 \quad 0 \quad \text{hook} \quad 0 \quad \text{hook} \end{array}$
 $\overset{\Delta}{\mathcal{A}} \begin{array}{c} \text{Diagram 3} \\ 1 \quad 0 \quad 1 \quad 0 \quad \text{hook} \quad 0 \quad \text{hook} \end{array}$
 $\overset{\Delta}{\mathcal{A}} \begin{array}{c} \text{Diagram 4} \\ 1 \quad 0 \quad 1 \quad 0 \quad \text{hook} \quad 0 \quad \text{hook} \end{array}$

$$\Delta_{\partial\tilde{A}} \begin{array}{ccccccccccc} \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright \\ 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & \chi & n \end{array}$$

Δ
 $\frac{1}{d}$

[illegible]

A diagram illustrating the decomposition of a blue cup into a red cup and a red cap. The blue cup is on the left, labeled with a blue '1' below it. To its right is a red cup, labeled with a red '1' below it, and a red cap, labeled with a red '0' below it. The red cup and cap together represent the same object as the blue cup.

$$\mathfrak{A} \begin{pmatrix} \textcircled{0} & \textcircled{0} & \textcircled{0} & \textcircled{0} & \textcircled{1} & \textcircled{0} & \textcircled{0} & \textcircled{0} \end{pmatrix} \begin{pmatrix} \textcircled{0} & \textcircled{0} & \textcircled{0} & \textcircled{0} & \textcircled{1} & \textcircled{0} & \textcircled{0} & \textcircled{0} \end{pmatrix}$$

Δ
 \mathcal{A}





H) Accented on Fourth to Last Syllable

Pa - Ga

01001 $\pi_q \frac{\text{---}}{0} \frac{\text{---}}{1} \frac{\text{---}}{0} \frac{\text{---}}{0} \frac{\text{---}}{1} \eta$

$\pi_q \frac{\text{---}}{0} \frac{\text{---}}{1} \frac{\text{---}}{0} \frac{\text{---}}{0} \frac{\text{---}}{1} \eta$

0001X0X $\pi_q \frac{\text{---}}{0} \frac{\text{---}}{0} \frac{\text{---}}{0} \frac{\text{---}}{1} \frac{\text{---}}{X} \frac{\text{---}}{0} \frac{\text{---}}{X} \eta$

Ga - Ga

10X0

1X0XX

101010

101001

Di - Ga

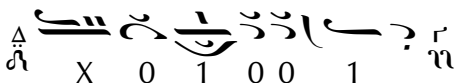
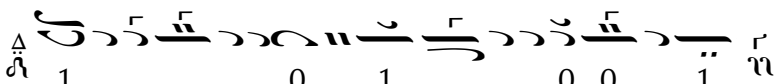

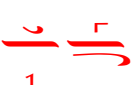
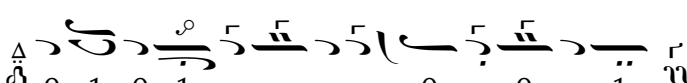
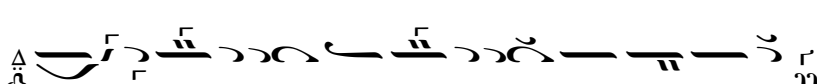



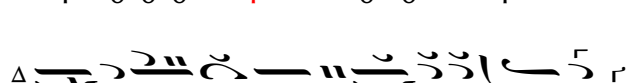
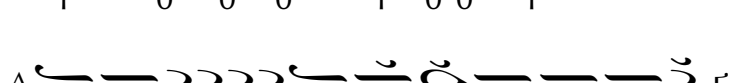
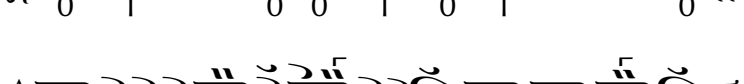

1001

001001

X01001

١٥

Grave Mode - Sticheraric

		
101001		
0001001		
0101001		
1001010		
01001001		
10001001		
		
01001010		
10101010		
010001010		

Medial Cadences on Di

I) Accented on Last Syllable

Pa - Di

0	$\pi \frac{\text{—}}{q} \frac{\Delta}{0} \frac{\Delta}{\text{di}}$
00	$\pi \frac{\text{—}}{q} \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\Delta}{\text{di}}$
001	$\pi \frac{\text{—}}{q} \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\Delta}{\text{di}}$
	$\pi \frac{\text{—}}{q} \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\Delta}{\text{di}}$
1001	$\pi \frac{\text{—}}{q} \frac{\text{—}}{1} \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\Delta}{\text{di}}$
	$\pi \frac{\text{—}}{q} \frac{\text{—}}{1} \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\Delta}{\text{di}}$
	$\pi \frac{\text{—}}{q} \frac{\text{—}}{1} \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\Delta}{\text{di}}$
01001	$\pi \frac{\text{—}}{q} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\Delta}{\text{di}}$
00001	$\pi \frac{\text{—}}{q} \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\Delta}{\text{di}}$
00101	$\pi \frac{\text{—}}{q} \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\Delta}{\text{di}}$
001001	$\pi \frac{\text{—}}{q} \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\Delta}{\text{di}}$
	$\pi \frac{\text{—}}{q} \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\text{—}}{0} \frac{\text{—}}{0} \frac{\text{—}}{1} \frac{\Delta}{\text{di}}$

—
0

Ga - Di

These formulae are used also as initial formulae.

$$0 \quad \overline{n_0} \quad \Delta \overline{n}$$

$$0000 \quad \overset{r}{\underbrace{\quad}_0} \overset{r}{\underbrace{\quad}_0} \overset{r}{\underbrace{\quad}_0} \overset{r}{\underbrace{\quad}_0} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$$

$$01 \quad \begin{array}{c} \text{r} \\ \text{n} \end{array} \quad \begin{array}{c} \text{---} \\ 0 \end{array} \quad \begin{array}{c} \text{---} \\ 1 \end{array} \quad \begin{array}{c} \Delta \\ \text{a} \end{array}$$

$$\begin{array}{c} \text{r} \\ \text{n} \end{array} \text{---} \begin{array}{c} \text{r} \\ 0 \end{array} \text{---} \begin{array}{c} \text{r} \\ 1 \end{array} \text{---} \begin{array}{c} \Delta \\ \text{r} \end{array}$$

[illegible]

$$\begin{array}{ccccccc} \tau & \rightarrow & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ n & & 0 & 0 & 1 & & \text{---} \end{array}$$

$$\begin{array}{ccccccc} \text{r} & \text{r} & \text{r} & & & & \\ \text{u} & \text{u} & \text{u} & \text{u} & \text{u} & \text{u} & \text{u} \\ 0 & 0 & 0 & 1 & 1 & 1 & 1 \end{array}$$

[illegible]

$$\begin{array}{ccccccc} \Gamma & \hookrightarrow & \text{---} & \text{---} & \hookrightarrow & \Delta \\ \eta & & 0 & 0 & 0 & 1 & \delta \end{array}$$

$$\begin{array}{ccccccccc} \text{r} & \text{r} & \text{r} & \text{r} & \text{r} & \text{r} & \text{r} & \text{r} & \text{r} \\ \text{n} & 0 & 0 & 0 & 1 & \text{r} & \text{r} & \text{r} & \text{r} \end{array}$$

0X01 $\frac{1}{n} \rightarrow \frac{1}{X} \rightarrow \frac{1}{0} \rightarrow \frac{1}{1} \rightarrow \frac{1}{\Delta}$

1001 $\overset{\circ}{\underset{1}{\text{u}}}\overset{\circ}{\underset{0}{\text{z}}}\overset{\circ}{\underset{0}{\text{z}}}\overset{\circ}{\underset{1}{\text{l}}}\overset{\circ}{\underset{5}{\text{r}}}\overset{\circ}{\underset{\Delta}{\text{a}}}$

01001 $\overline{0} \quad \overline{1} \quad \overline{0} \quad \overline{0} \quad \overline{1} \quad \overline{\Delta}$

$$\frac{2}{1}$$

Grave Mode - Sticheraric

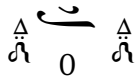
10001		
000001		
010001		
101001		
0001001		
0010001		
0101001		
1001001		
1010001		
0X10001		
00100001		
00101001		
10010001		

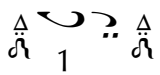
Grave Mode - Sticheraric

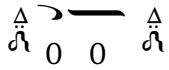
0X0101001 

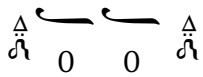
Di - Di

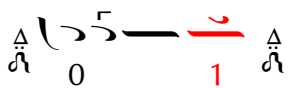
0 



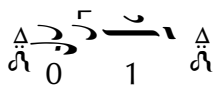
1 

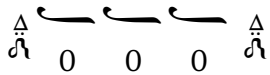
00 

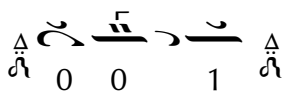


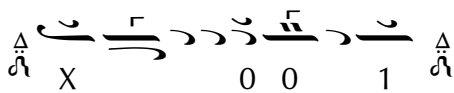
01 

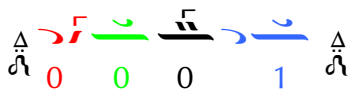




000 

001 

X001 















Grave Mode - Sticheraric






 0  1

 1  1

0000  0  0  0  0 

1001  1  0  0  1 


 1

 1  0  0  1 





 1

 1


 1


 1

 1







00001  0  0  0  0  1 

 0

 1

 1

 1

 0  0  0  0  1 

01001  0  1  0  0  1 

Grave Mode - Sticheraric

10001		
010001		
0X0001		
100001		
000101		
0001001		
0010001		

Grave Mode - Sticheraric

0X00001

1000101

0010001

0101001

1100001001

Ga - Di

These formulae are used also as initial formulae.

10

$\frac{1}{\sqrt{1}} \sim \frac{\sqrt{1}}{1} = 1$

$$r_1 \rightarrow \pi \rightarrow l \rightarrow ? \rightarrow \Delta$$
$$\begin{array}{cccc} \overline{r} & \overline{v} & \overline{u} & \overline{\Delta} \\ r & 1 & 0 & \delta \end{array}$$
$$\begin{array}{c} \text{r} \quad \text{1} \quad \text{0} \\ \text{n} \quad \text{1} \quad \text{0} \end{array}$$
$$\frac{1}{n} \sum_{i=1}^n \frac{1}{\sigma_i^2} \Delta_i$$

010

$\frac{1}{n} \xrightarrow{0} \frac{1}{1} \xrightarrow{0} \frac{1}{0} \xrightarrow{1} \frac{1}{1}$

0

$$\begin{array}{ccccccc} \Gamma & \hookrightarrow & \hookrightarrow & \xrightarrow{\Gamma} & \hookrightarrow & \xrightarrow{\Delta} & \\ \mathfrak{U}_0 & & 1 & & 0 & & \mathfrak{A} \end{array}$$
$$\begin{array}{ccccccc} \Gamma & \hookrightarrow & \mathbb{N} & \xrightarrow{\quad} & \mathbb{N} & \xrightarrow{\quad} & \mathbb{N} \\ \eta & & 0 & & 1 & & 0 \end{array} \quad \Delta$$
$$\begin{array}{ccccccc} \Gamma & \hookrightarrow & \underline{\mathbb{N}} & \hookrightarrow & \Delta & & \\ \eta & & 0 & 1 & 0 & & \mathfrak{A} \end{array}$$
$$\begin{array}{ccccccc} \Gamma & & \Gamma & & \Gamma & & \Delta \\ \cap & & \cap & & \cap & & \cap \\ \hline 0 & & 1 & & 0 & & 0 \end{array}$$
$$\begin{array}{ccccccc} \text{r} & & \text{r} & & \text{r} & & \Delta \\ \text{r} & & \text{r} & & \text{r} & & \text{r} \\ 0 & & 1 & & 0 & & \text{r} \end{array}$$

0010

Diagram illustrating the binary representation of the number 1 using strokes. The strokes are labeled with their corresponding binary values: 0, 0, 1, and 0.

Grave Mode - Sticheraric

001010	
010010	
100010	
000010	
0010010	
1000010	
1001010	
10100010	
000001010	

Di - Di

10	
----	--

$\overset{\Delta}{\mathfrak{A}} \overset{\neg}{\text{—}} \neg \overset{\Delta}{\mathfrak{A}}$
1 0

$\overset{\Delta}{\mathfrak{A}} \overset{=}{\text{—}} \neg \overset{\Delta}{\mathfrak{A}}$
1 0

$\overset{\Delta}{\mathfrak{A}} \neg \overset{\Delta}{\mathfrak{A}}$
1 0

$\overset{\Delta}{\mathfrak{A}} \text{—} \neg \text{—} \neg \overset{\Delta}{\mathfrak{A}}$
1 0

$\overset{\Delta}{\mathfrak{A}} \overset{\neg}{\text{—}} \neg \neg \overset{\Delta}{\mathfrak{A}}$
1 0

$\overset{\Delta}{\mathfrak{A}} \neg \neg \neg \neg \overset{\Delta}{\mathfrak{A}}$
1 0

010

$\overset{\Delta}{\mathfrak{A}} \text{—} \overset{\neg}{\text{—}} \neg \overset{\Delta}{\mathfrak{A}}$
0 1 0

\neg
0

$\overset{\Delta}{\mathfrak{A}} \text{—} \overset{=}{\text{—}} \neg \overset{\Delta}{\mathfrak{A}}$
0 1 0

$\overset{\Delta}{\mathfrak{A}} \neg \neg \neg \neg \overset{\Delta}{\mathfrak{A}}$
0 1 0

$\overset{\Delta}{\mathfrak{A}} \text{—} \neg \neg \neg \neg \overset{\Delta}{\mathfrak{A}}$
0 1 0

$\overset{\Delta}{\mathfrak{A}} \text{—} \neg \neg \neg \neg \overset{\Delta}{\mathfrak{A}}$
0 1 0

$\overset{\Delta}{\mathfrak{A}} \neg \neg \neg \neg \overset{\Delta}{\mathfrak{A}}$
0 1 0

$\overset{\Delta}{\mathfrak{A}} \neg \neg \neg \neg \overset{\Delta}{\mathfrak{A}}$
0 1 0

0010

$\overset{\Delta}{\mathfrak{A}} \neg \neg \neg \neg \overset{\Delta}{\mathfrak{A}}$
0 0 1 0

$\neg \neg$
0 0

Grave Mode - Sticheraric

$\Delta_{\vec{a}_1} \quad \vec{a}_1 \quad \vec{a}_2 \quad \vec{a}_3 \quad \vec{a}_4 \quad \Delta_{\vec{a}_4}$
 0 0 1 0

0 0

0 0

$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \ddot{\mathfrak{A}} & \curvearrowright & \text{---} & \text{=} & \text{=} & \text{=} & \ddot{\mathfrak{A}} \\ 0 & 0 & 1 & 0 & & & \end{array}$$
$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \text{♂} & \text{♂} & \text{♂} & \text{♂} & \text{♂} & \text{♂} & \text{♂} \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 \end{array}$$

Δ
 δ 0 0 1 0 δ

$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \partial & & & & & & \partial \\ 0 & 0 & 1 & & & & 0 \end{array}$$
$$\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}} \overset{\sigma}{\underset{0}{\curvearrowright}} \overset{\sigma}{\underset{0}{\curvearrowright}} \overset{\sigma}{\underset{1}{\curvearrowright}} \overset{\sigma}{\underset{0}{\curvearrowright}} \overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$$

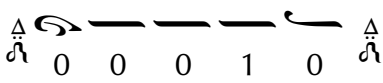
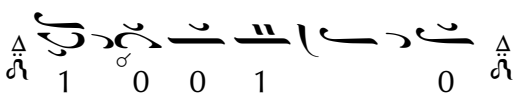
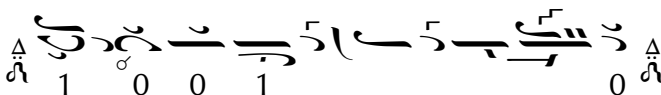
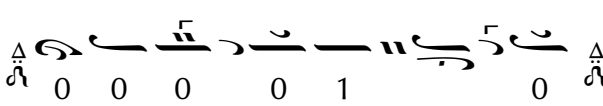
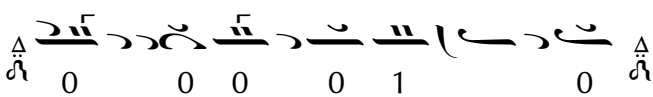
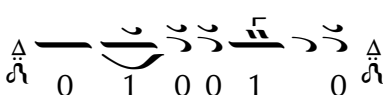
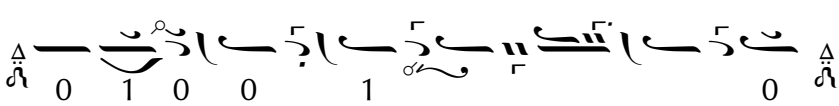
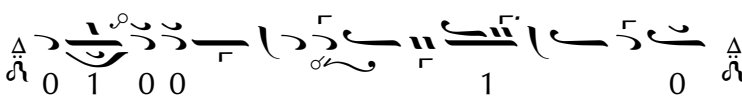
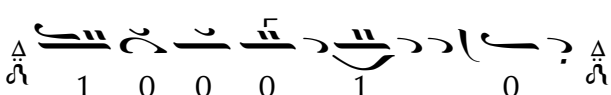
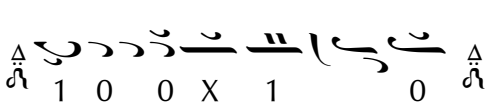
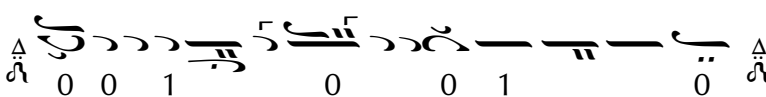
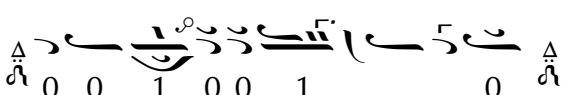

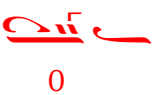
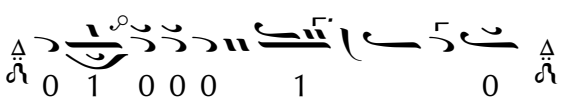
01010

[illegible]
$$\begin{array}{c} \Delta \\ \text{A} \\ 0 \quad 1 \quad 0 \quad 1 \quad 0 \end{array}$$

00010

$$\begin{array}{ccccccc} \Delta & & \Delta & & \Delta & & \Delta \\ \text{A} & & \text{B} & & \text{C} & & \text{D} \\ \hline 0 & 0 & 0 & 1 & 5 & 5 & 5 \\ \hline \end{array}$$
$$\frac{5}{0}$$
[illegible]
$$\frac{5}{0}$$
$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \downarrow & & & & & & \downarrow \\ \mathfrak{A} & \xrightarrow{\quad} & \mathfrak{A} & \xrightarrow{\quad} & \mathfrak{A} & \xrightarrow{\quad} & \mathfrak{A} \\ 0 & 0 & 0 & 1 & 0 & & \end{array}$$

Grave Mode - Sticheraric

		
10010		
		
000010		
		
010010		
		
		
100010		
		
0010010		
		
0100010		
		

K) Accented on Third to Last Syllable

Pa - Di

0100

π_q $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{\Delta}{\mathfrak{A}}$

00100

π_q $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{\Delta}{\mathfrak{A}}$

001010

π_q $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{\Delta}{\mathfrak{A}}$

00101

π_q $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{\Delta}{\mathfrak{A}}$

01000100

π_q $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{\Delta}{\mathfrak{A}}$

Ga - Di


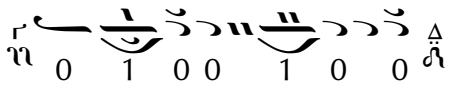
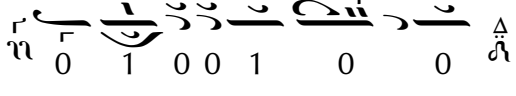
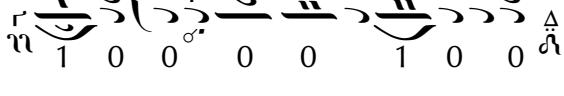
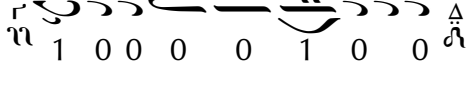
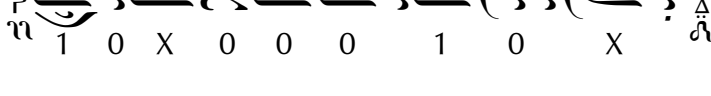
These formulae are used also as initial formulae.

100		
0100		




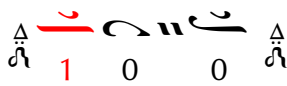

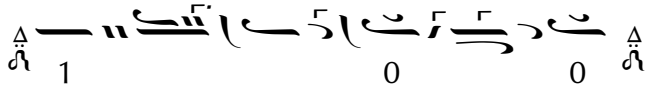

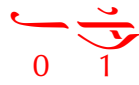
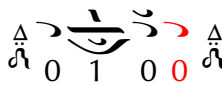

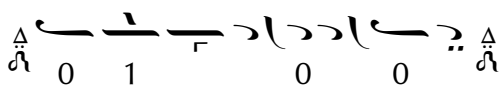
Grave Mode - Sticheraric

0X01	
00100	
X0100	
10100	
000100	
0X010X	
010100	
100100	

Grave Mode - Sticheraric

	
0100100	
	
1000100	
	
10X00010X	

Di - Di

100		
		
		
		
0100		
		
		

Grave Mode - Sticheraric

$$\begin{array}{ccccccc} \Delta & \curvearrowright & \overline{\curvearrowright} & \overline{\curvearrowright} & \curvearrowright & \overline{\curvearrowright} & \Delta \\ \mathfrak{A} & 0 & 1 & 0 & 0 & & \mathfrak{A} \end{array}$$
$$\overset{\Delta}{\underset{0}{\textcircled{A}}} \text{---} \text{||} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{\Delta}{\underset{0}{\textcircled{A}}}$$

$$\frac{1}{0} \neq \frac{2}{0}$$

$$\frac{\quad}{0} \quad \frac{\quad}{0}$$

010X

Δ Δ
 \mathfrak{A} 0 1 0 X \mathfrak{A}

$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \text{♩} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{♩} \\ 0 & 1 & 0 & X & & & \end{array}$$

00100

Δ 0 0 1 0 0 Δ

$$\overset{\Delta}{\mathfrak{d}} \begin{array}{ccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 0 & 1 & 0 & 0 \end{array} \overset{\Delta}{\mathfrak{d}}$$

$$\frac{1}{0} \neq \frac{2}{0}$$

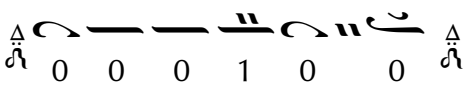
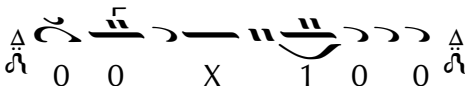
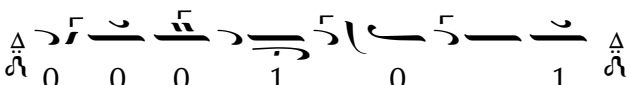
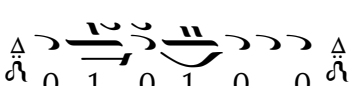
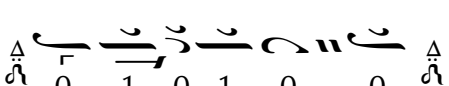

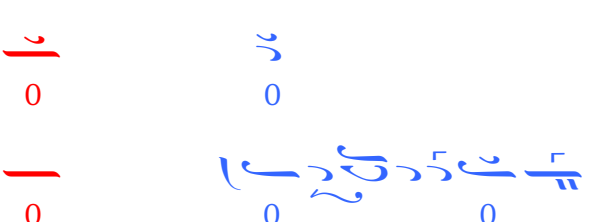
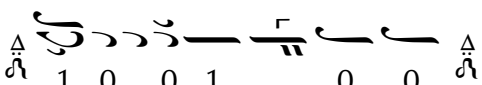
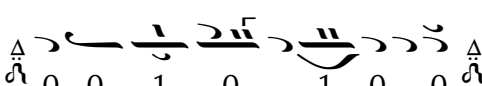
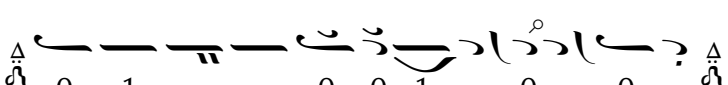
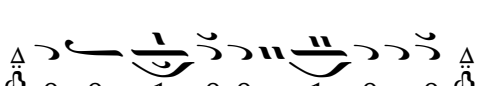
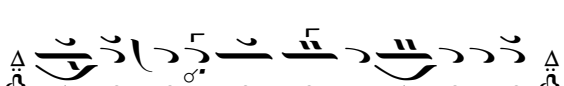
$$\frac{\quad}{0} \quad \frac{\quad}{0}$$

000100

$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \text{♩} & \text{—} & \text{—} & \text{♩} & \text{—} & \text{—} & \text{♩} \\ 0 & 0 & 0 & 1 & 0 & 0 & \end{array}$$

0.2

Grave Mode - Sticheraric

	
00X100	
000101	
010100	
	
	
	
100100	
0010100	
0100100	
00100100	
10000100	


L) Accented on Fourth to Last Syllable


Pa - Di


1001	
01001	
01010	
001001	
00X010	
001010	

Ga - Di

These formulae are used also as initial formulae.

1001 

1010 

01001 

Grave Mode - Sticheraric

01010

101001

001010

0001001

0101001

1001001

1001010

00101001

0X0101001

000001010

Di - Di

1001

Grave Mode - Sticheraric

$\overset{\Delta}{\mathfrak{A}}$
 $\overset{\Delta}{\mathfrak{A}}$

01001
 $\overset{\Delta}{\mathfrak{A}}$
 $\overset{\Delta}{\mathfrak{A}}$

$\overset{\Delta}{\mathfrak{A}}$
 $\overset{\Delta}{\mathfrak{A}}$

01010
 $\overset{\Delta}{\mathfrak{A}}$
 $\overset{\Delta}{\mathfrak{A}}$

$\overset{\Delta}{\mathfrak{A}}$
 $\overset{\Delta}{\mathfrak{A}}$

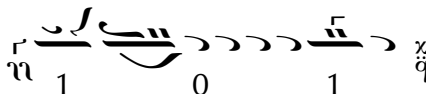
0001001
 $\overset{\Delta}{\mathfrak{A}}$
 $\overset{\Delta}{\mathfrak{A}}$

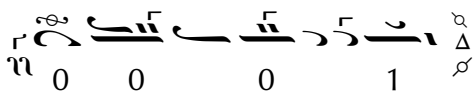
0101001
 $\overset{\Delta}{\mathfrak{A}}$
 $\overset{\Delta}{\mathfrak{A}}$

1100001001
 $\overset{\Delta}{\mathfrak{A}}$
 $\overset{\Delta}{\mathfrak{A}}$

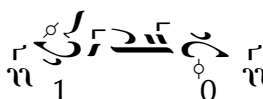
M) Fthores


Accented on last syllable:

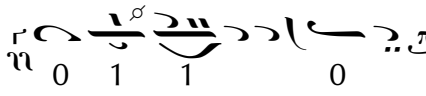
101 


0001 

Accented on second to last syllable:

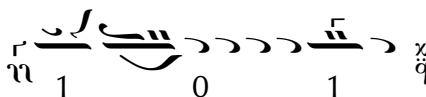
10 

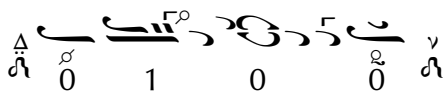
010 

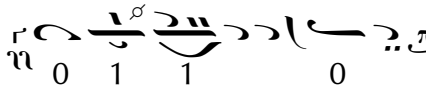
0110 

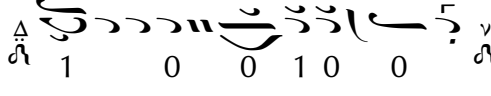
0X010 


Accented on third to last syllable:

101 

0100 

0110 

100100 

1000100 

Accented on fourth to last syllable:

0X010 $\frac{\Delta}{\lambda}$ 0 X 0 1 0 $\frac{6}{\lambda}$

0001010

Δ

0 0 0 1 0 1 0 π

0 1

N) Old (slow) Sticheraric Formulae

Interestingly, grave mode has only a few old sticheraric formulae, whereas all other modes (except for third mode) have dozens.

Accented on last syllable:

0010001

Accented on second to last syllable:

10 $\Delta_{\mathfrak{d}} \rightarrow \pi \rightarrow 0 \rightarrow \mathfrak{z} \rightarrow \mathfrak{z} \rightarrow \mathfrak{z} \rightarrow \mathfrak{z} \rightarrow \mathfrak{z}$

10

$\frac{\Delta}{\partial \lambda} \left(- \frac{1}{z} \right) = \frac{1}{z^2}$

010

$\frac{1}{n} \frac{\partial}{\partial t} \left(\frac{1}{r} \frac{\partial}{\partial r} \left(r \frac{\partial u}{\partial r} \right) \right)$

π_q

0 0 0 1 ? 0 x_q

Grave Mode - Sticheraric

10010

10010

001100

100010

Accented on third to last syllable:

100

100

100

0100

00100

Grave Mode - Sticheraric

[illegible][illegible]

Accented on fourth to last syllable:

[illegible]


00101001 Δ
α̇ 0 0 1 0 1 r — — " " v j S l α̇ n

O) Final Cadences:

Accented on last syllable:

(Use formulae below ending with 100 or 1001)

Accented on second to last syllable:

101010 

Grave Mode - Sticheraric

Accented on third to last syllable:

100

01100

000100

0000

00

00

Grave Mode - Sticheraric

100100

$\overset{\Delta}{\mathfrak{A}}$

 (orthographically incorrect but frequent in the Zoe *Anastasimatarion*)

100100

$\overset{\Delta}{\mathfrak{A}}$

1000100

$\overset{\Delta}{\mathfrak{A}}$

 $\overset{\Delta}{\mathfrak{A}}$

0101010X

$\overset{\Delta}{\mathfrak{A}}$

Accented on fourth to last syllable:

001001

$\overset{\Delta}{\mathfrak{A}}$

101010

$\overset{\Delta}{\mathfrak{A}}$

Grave Mode - Sticheraric

0001001		
1001001		
10001001		
10001010		
101001001		

P) Final Cadences for Theotokia

100010X		
0100010X		
100		

BYZANTINE MUSIC FORMULÆ

Pentaphonos "Protovarys" Grave Mode - Sticheraric

Contents^{*}

A) Medial Cadences on Di.....	722
B) Medial Cadences on Pa.....	727
C) Medial Cadences on Zo	731
D) Medial Cadences on Ga.....	734
E) Medial Cadences on Ke.....	736
F) Medial Cadences on High Zo	737
G) Formulae from High Zo	739
H) Formulae with Fthoras	740
I) Endings for Theotokia.....	741

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

* The Byzantine music formulae herein were extracted from all the sticheraric protovarys melodies found in the *Zoe Anastasimatarion* (14th edition, 2002) and the *Anastasimatarion Neon* (1853 edition). The latter contains the troparia of grave mode composed "kata to pentaphonon" by Georgios the Kres (d. 1816), as transcribed from the old notation by Z. Zapheiroopoulos (d. 1851). Due to the limited number of troparia written in this rare mode, this compilation of formulae is not as thorough as our other compilations. Nevertheless, one may deduce other formulae in this mode by interpolating the formulaic rules and patterns found in other diatonic modes.

A) Medial Cadences on Di

Accented on last syllable:

From Di

$$00 \quad \overset{\Delta}{\underset{\Delta}{\mathfrak{A}}} \overset{\Delta}{\underset{\Delta}{0}} \overset{\Delta}{\underset{\Delta}{0}} \overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$$
$$000 \quad \overset{\Delta}{\underset{\cdot\cdot}{\mathfrak{A}}} \quad \overset{\Delta}{\underset{\cdot\cdot}{\mathfrak{A}}} \quad \overset{\Delta}{\underset{\cdot\cdot}{\mathfrak{A}}} \quad \overset{\Delta}{\underset{\cdot\cdot}{\mathfrak{A}}}$$
$$0000 \quad \overset{\Delta}{\mathfrak{A}} \quad \overset{\Delta}{\mathfrak{A}} \quad \overset{\Delta}{\mathfrak{A}} \quad \overset{\Delta}{\mathfrak{A}} \quad \overset{\Delta}{\mathfrak{A}}$$

010001

$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \text{♩} & 0 & 1 & 0 & 0 & 0 & 1 & \text{♩} \end{array}$$

100001

From Pa

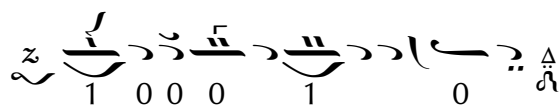
$$00 \quad \pi \overline{0} \overline{0} \Delta \overline{0}$$
$$0001 \quad \pi \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \Delta$$

From Zo

$$00 \quad \sim \quad \frac{1}{0} \quad \frac{1}{0} \quad \frac{\Delta}{\partial}$$
$$00X0 \quad z \quad \overbrace{\quad}^f \quad \underbrace{\quad}_0 \quad \underbrace{\quad}_0 \quad \underbrace{\quad}_X \quad \underbrace{\quad}_0 \quad \underbrace{\quad}_{\frac{\Delta}{\hbar}}$$
$$0001 \quad \begin{array}{c} \sim \\ \sim \end{array} \xrightarrow{0} \xrightarrow{0} \xrightarrow{0} \xrightarrow{1} \xrightarrow{\Delta} \mathbb{A}^1$$

Grave Mode - Protovarys (Sticheraric)

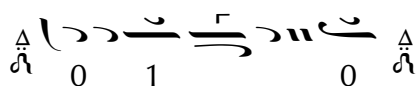
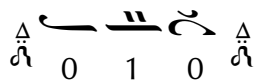
100010



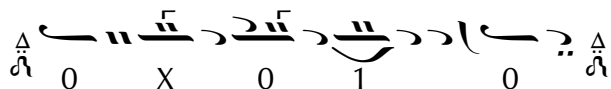
Accented on second to last syllable:

From Di

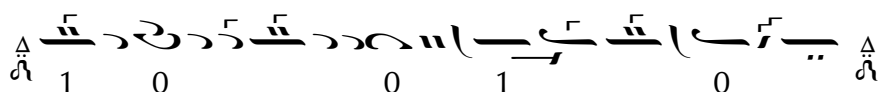
010



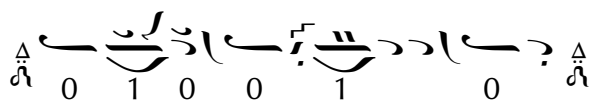
0X010



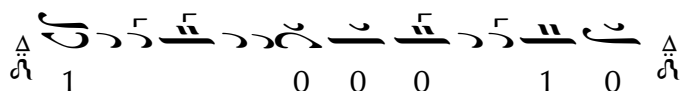
10010



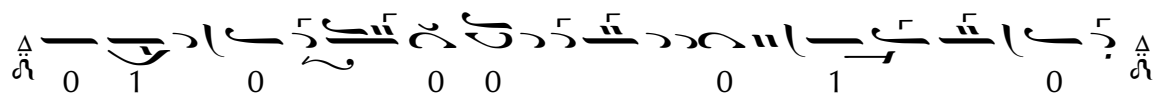
010010



100010

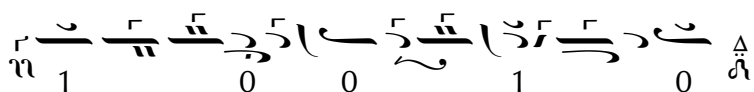


01000010



From Ga

10010



From Pa

Grave Mode - Protovarys (Sticheraric)

10	$\pi_q \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \overset{\Delta}{\text{♩}}$
	$\pi_q \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \overset{\Delta}{\text{♩}}$
010	$\pi_q \begin{array}{c} \text{♩} \\ 0 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \overset{\Delta}{\text{♩}}$
0010010	$\pi_q \text{—} \text{—} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \overset{\Delta}{\text{♩}}$

From Zo

010	$\text{♩} \begin{array}{c} \text{♩} \\ 0 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \overset{\Delta}{\text{♩}}$
-----	--

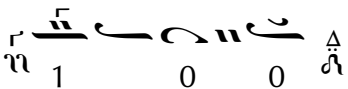
Accented on third to last syllable:

From Di

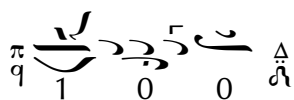
100	$\overset{\Delta}{\text{♩}} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \overset{\Delta}{\text{♩}}$
	$\overset{\Delta}{\text{♩}} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \overset{\Delta}{\text{♩}}$
110	$\overset{\Delta}{\text{♩}} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \overset{\Delta}{\text{♩}}$
0100	$\overset{\Delta}{\text{♩}} \text{—} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \overset{\Delta}{\text{♩}}$
100100	$\overset{\Delta}{\text{♩}} \text{—} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \overset{\Delta}{\text{♩}}$
1000100	$\overset{\Delta}{\text{♩}} \text{—} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 1 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \text{—} \begin{array}{c} \text{♩} \\ 0 \end{array} \overset{\Delta}{\text{♩}}$


From Ga

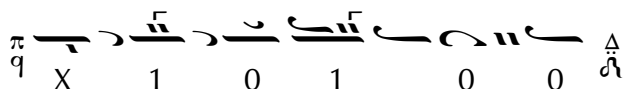
Grave Mode - Protovarys (Sticheraric)

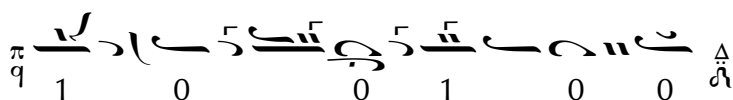
100 

From Pa


100 

0X0100 

X10100 

100100 

From Zo

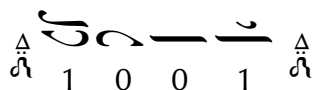
100 

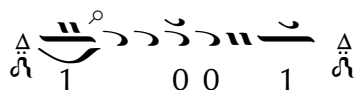
Accented on fourth to last syllable:

From Di

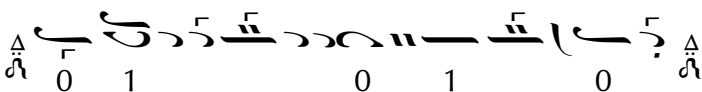
1001 



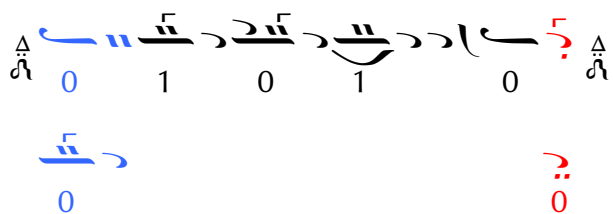




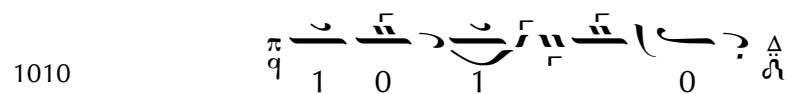
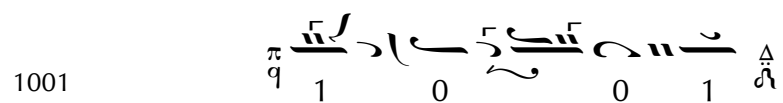
01001 

01010 

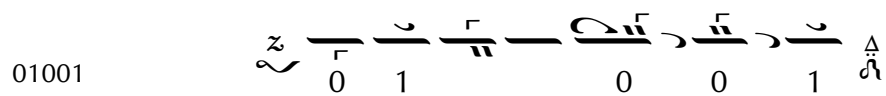
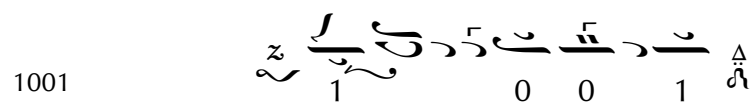
Grave Mode - Protovarys (Sticheraric)



From Pa



From Zo

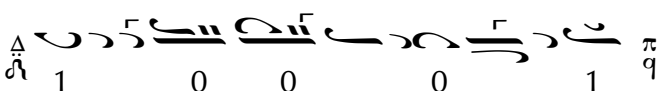


B) Medial Cadences on Pa

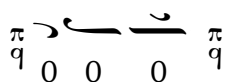
Accented on last syllable:

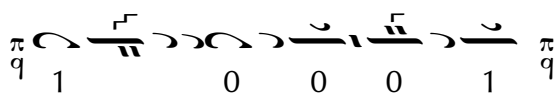
From Di

00 

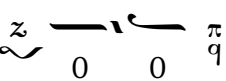
10001 

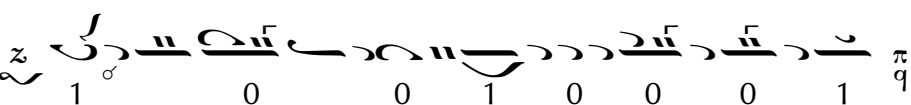
From Pa

000 

10001 


From Zo

00 

10010001 

Accented on second to last syllable:

From Di


10 

010 



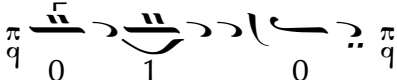
Grave Mode - Protovarys (Sticheraric)

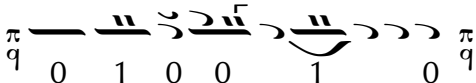
010010 

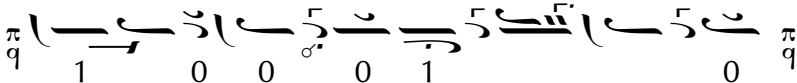
0100010 

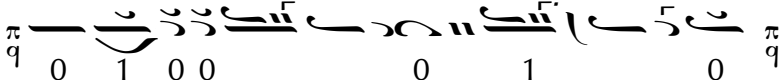
From Pa

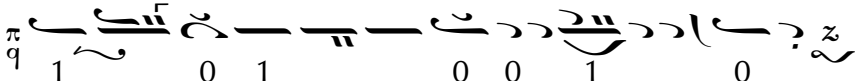
10 

010 

010010 

100010 

0100010 

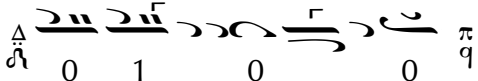
1010010 


From Zo

10010 

Accented on third to last syllable:

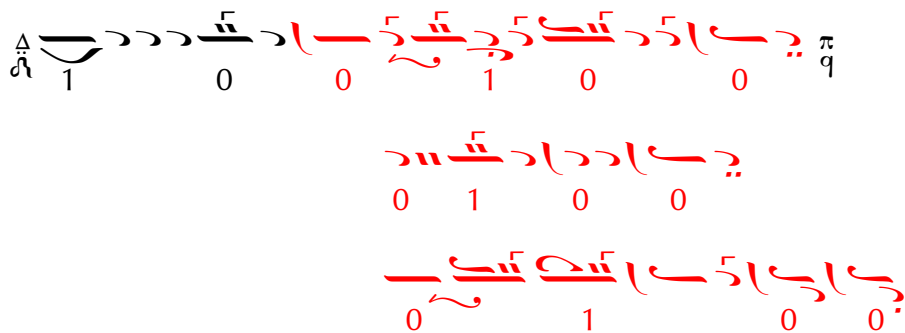
From Di

0100 

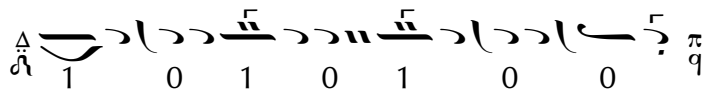
00100 

Grave Mode - Protovarys (Sticheraric)

100100

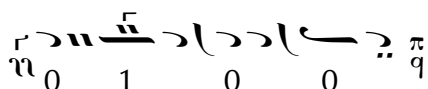


1010100

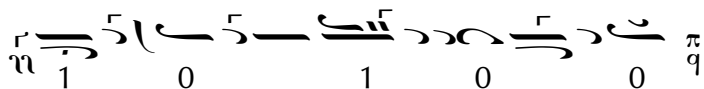


From Ga

0100



10100

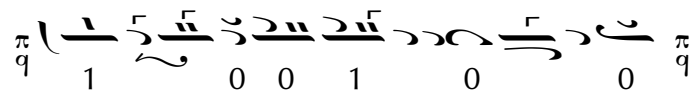


From Pa

0100

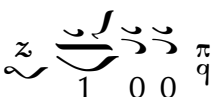


100100

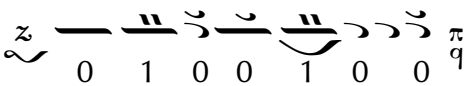


From Zo

100



0100100



Accented on fourth to last syllable:

From Di

Grave Mode - Protovarys (Sticheraric)

01010

$\overset{\Delta}{\underset{d}{\mathfrak{A}}} \begin{array}{c} \text{hook} \\ 0 \end{array} \begin{array}{c} \text{hook} \\ 1 \end{array} \begin{array}{c} \text{hook} \\ 0 \end{array} \begin{array}{c} \text{hook} \\ 1 \end{array} \begin{array}{c} \text{hook} \\ 0 \end{array} \pi_q$

$\overset{\Delta}{\underset{d}{\mathfrak{A}}} \begin{array}{c} \text{hook} \\ 0 \end{array} \begin{array}{c} \text{hook} \\ 1 \end{array} \begin{array}{c} \text{hook} \\ 0 \end{array} \begin{array}{c} \text{hook} \\ 1 \end{array} \begin{array}{c} \text{hook} \\ 0 \end{array} \begin{array}{c} \text{hook} \\ 1 \end{array} \begin{array}{c} \text{hook} \\ 0 \end{array} \begin{array}{c} \text{hook} \\ 1 \end{array} \begin{array}{c} \text{hook} \\ 0 \end{array} \begin{array}{c} \text{hook} \\ 1 \end{array} \begin{array}{c} \text{hook} \\ 0 \end{array} \pi_q$

From Pa

1100

$\pi_q \begin{array}{c} \text{hook} \\ 1 \end{array} \begin{array}{c} \text{hook} \\ 1 \end{array} \begin{array}{c} \text{hook} \\ 0 \end{array} \begin{array}{c} \text{hook} \\ 0 \end{array} \begin{array}{c} \text{hook} \\ 0 \end{array} \begin{array}{c} \text{hook} \\ 0 \end{array} \pi_q$

From Zo

1001

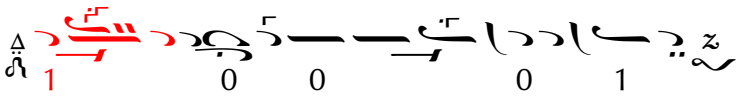

$\overset{z}{\underset{z}{\mathfrak{A}}} \begin{array}{c} \text{hook} \\ 1 \end{array} \begin{array}{c} \text{hook} \\ 0 \end{array} \begin{array}{c} \text{hook} \\ 0 \end{array} \begin{array}{c} \text{hook} \\ 1 \end{array} \pi_q$

C) Medial Cadences on Zo

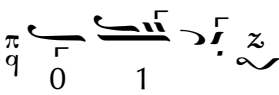
(These are also used as final cadences.)

Accented on last syllable:

From Di

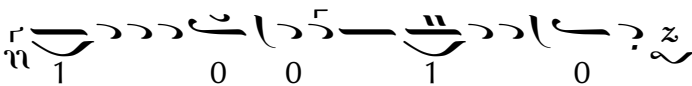
10001  

From Pa

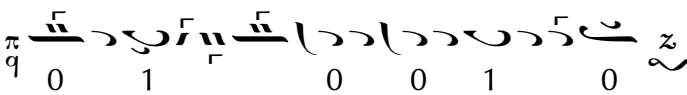
01 

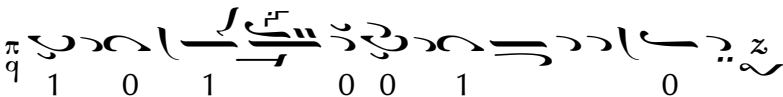
Accented on second to last syllable:

From Ga

10010 

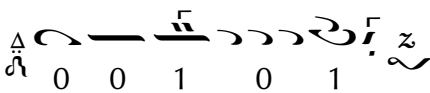
From Pa


010010 

1010010 

Accented on third to last syllable:

From Di

00100 

10100 

Grave Mode - Protovarys (Sticheraric)

100100	
1000100	
1000100	
1000100	

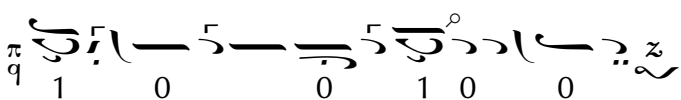
From Ga

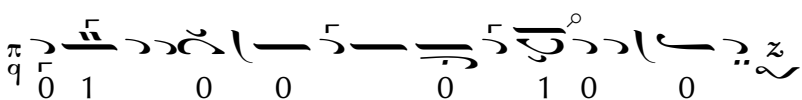
100100	
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From Pa

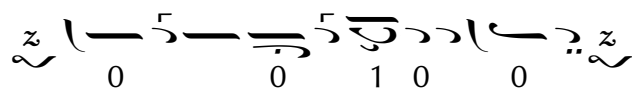
0100	
10100	

Grave Mode - Protovarys (Sticheraric)

100100 

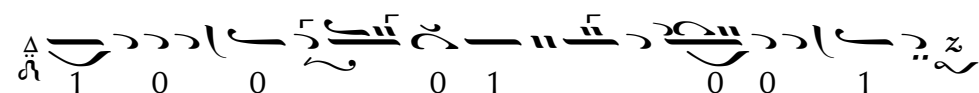
01000100 

From Zo

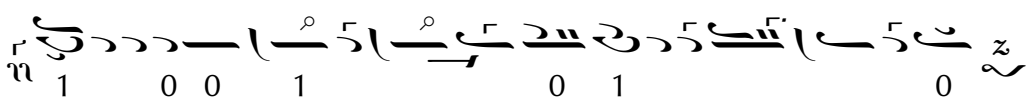
00100 

Accented on fourth to last syllable:

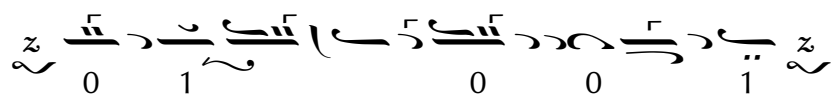
From Di

10001001 

From Ga

1001010 

From Zo

01001 

D) Medial Cadences on Ga

From Ke

10001

From Di

000

0000

01

100

0010

10001

10001

10001

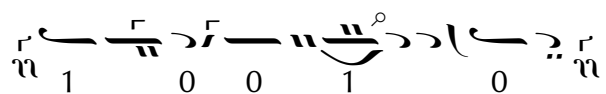
From Ga

10001

10001

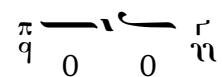
Grave Mode - Protovarys (Sticheraric)

10010

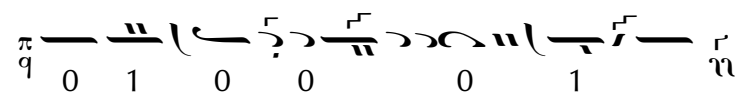


From Pa

00

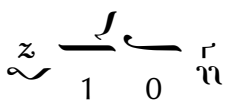


010001

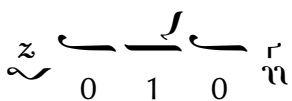


From Zo

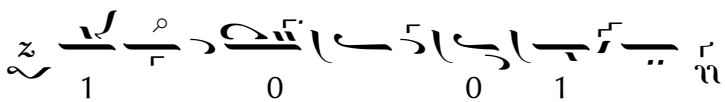
10



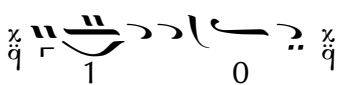
010

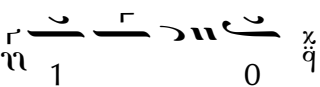


1001

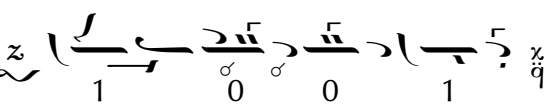


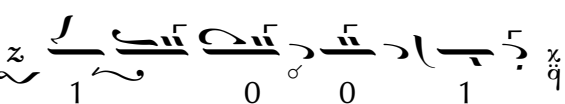
E) Medial Cadences on Ke

10 

10 

0001 

1001 

1001 

F) Medial Cadences on High Zo

Accented on last syllable:

From High Zo

100001 $\begin{array}{c} z' \\ \lambda \end{array} \overbrace{\quad}^{\text{f}} \underbrace{\quad}_1 \overbrace{\quad}^{\text{f}} \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_1 \begin{array}{c} z' \\ \lambda \end{array}$

1010001 $\begin{array}{c} z' \\ \lambda \end{array} \underbrace{\quad}_1 \underbrace{\quad}_0 \underbrace{\quad}_1 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_1 \begin{array}{c} z' \\ \lambda \end{array}$

1000001 $\begin{array}{c} z' \\ \lambda \end{array} \underbrace{\quad}_1 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_1 \begin{array}{c} z' \\ \lambda \end{array}$

From Di

00001 $\begin{array}{c} \Delta \\ \lambda \end{array} \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_1 \begin{array}{c} z' \\ \lambda \end{array}$

From Zo

0101 $\begin{array}{c} z \\ \lambda \end{array} \underbrace{\quad}_0 \underbrace{\quad}_1 \underbrace{\quad}_0 \underbrace{\quad}_1 \begin{array}{c} z' \\ \lambda \end{array}$

Accented on second to last syllable:

From High Zo

10 $\begin{array}{c} z' \\ \lambda \end{array} \underbrace{\quad}_1 \underbrace{\quad}_0 \begin{array}{c} z' \\ \lambda \end{array}$

10010 $\begin{array}{c} z' \\ \lambda \end{array} \underbrace{\quad}_1 \underbrace{\quad}_0 \underbrace{\quad}_0 \underbrace{\quad}_1 \underbrace{\quad}_0 \begin{array}{c} z' \\ \lambda \end{array}$

From Zo

10 $\begin{array}{c} z \\ \lambda \end{array} \underbrace{\quad}_1 \underbrace{\quad}_0 \begin{array}{c} z' \\ \lambda \end{array}$

Grave Mode - Protovarys (Sticheraric)

Accented on third to last syllable:

From High Zo

$$0100 \quad z'_{\lambda} \text{---} \overset{\text{"}}{\underset{0}{\smash{\cdot}}} \text{---} \overset{\text{"}}{\underset{1}{\smash{\cdot}}} \text{---} \text{---} \overset{\text{"}}{\underset{0}{\smash{\cdot}}} \text{---} \overset{\text{"}}{\underset{0}{\smash{\cdot}}} \text{---} z'_{\lambda}$$

From Ga

$$100100 \quad \begin{array}{ccccccc} \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright \\ \hline 1 & 0 & 0 & 1 & 0 & 0 & z'_{\lambda} \end{array}$$

From Zo

0101 $z \xrightarrow{0} \xrightarrow{1} \xrightarrow{0} \xrightarrow{1} z'$

Accented on fourth to last syllable:

From High Zo

1001 $z'_\kappa \rightarrow \frac{z'_\kappa}{1} \rightarrow \frac{z'_\kappa}{0} \rightarrow \frac{z'_\kappa}{0} \rightarrow \frac{z'_\kappa}{1} \rightarrow z'_\kappa$

0x010 $\frac{z'}{\lambda} \frac{2\pi}{0} \frac{2\pi}{r} (-5 - \sqrt{5}) \frac{2\pi}{5} (-\frac{r}{2} \frac{\pi}{2} \frac{2\pi}{2} \frac{r}{2} \frac{\pi}{2}) \frac{\Delta}{\delta}$

From Pa

01001 $\pi_q \frac{1}{0} \frac{2}{1} \frac{7}{\infty} \frac{3}{0} \frac{5}{0} \frac{1}{1} \frac{6}{\infty} z'_x$

G) Formulae from High Zo

(that don't end on high Zo)

Accented on last syllable:

001001

0 0 1 0 0 1 Δ

Accented on second to last syllable:

00010

$\begin{array}{c} z' \\ \lambda \end{array}$
 $\begin{array}{c} 0 \\ \delta \end{array}$

[illegible]

000010

z'_λ
 Δ

100010

Accented on third to last syllable:

100010X

z'_κ
 z'_κ

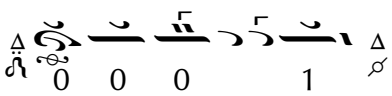
Accented on fourth to last syllable:

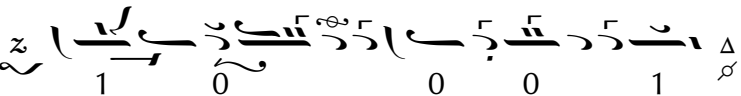
1010 $z'_\lambda \quad \underbrace{\quad}_1 \quad \underbrace{\quad}_0 \quad \underbrace{\quad}_1 \quad \underbrace{\quad}_0 \quad \pi_q$

001001

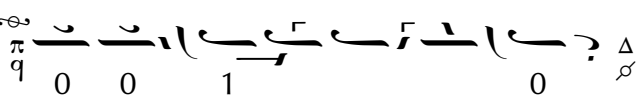
H) Formulae with Fthoras

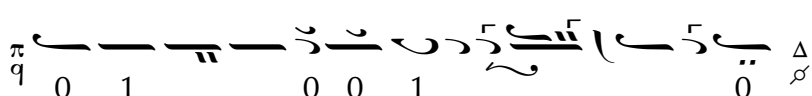
Accented on last syllable:

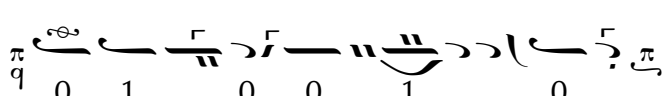
0001 

10001 

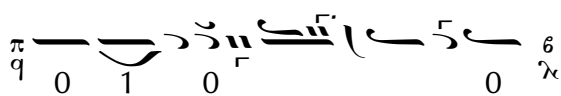
Accented on second to last syllable:

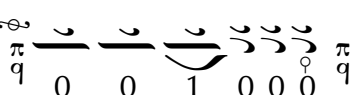
0010 

010010 

10010 

Accented on third to last syllable:

0100 

00100 

Accented on fourth to last syllable:

1001 

I) Endings for Theotokia

Accented on third to last syllable:

From High Zo

1000101 $\begin{array}{cccccccc} \text{z}' & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} \\ \text{λ} & 1 & 0 & 0 & 0 & 1 & 0 & 1 \end{array}$

$\begin{array}{cccccccc} \text{z}' & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} \\ \text{λ} & 1 & 0 & 0 & 0 & 1 & 0 & 1 \end{array}$

From Di

00101 $\begin{array}{ccccccc} \Delta & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} \\ \text{d} & 0 & 0 & 1 & 0 & 1 & 1 \end{array}$

1000101 $\begin{array}{cccccccc} \Delta & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} \\ \text{d} & 1 & 0 & 0 & 0 & 1 & 0 & 1 \end{array}$

Accented on fourth to last syllable:

From Zo

X010 $\begin{array}{ccccccc} \text{z} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} \\ \text{x} & 1 & 0 & 1 & 0 & 1 & 1 \end{array}$

BYZANTINE MUSIC FORMULAE

Grave Mode - Heirmologic

Contents^{*}

A) Medial Cadences on Pa.....	743
B) Medial Cadences on Ga	746
C) Medial Cadences on Di.....	754
D) Formulae with Fthoras	775
E) Ending Formulae.....	776
F) Endings for Theotokia	780

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

* The Byzantine music formulae herein were extracted from heirmologic melodies found in the Zoe Anastasimatarion (14th edition, 2002).

A) Medial Cadences on Pa

Accented on last syllable:

From Pa

00 π
q 0 0 q

From Ga

(use a 100 formula)

From Di

(use a 100 formula)

Accented on second to last syllable:

From Ga

010010 π
n 0 1 0 0 1 0 q

00X010010 π
n 0 0 X 0 1 0 0 1 0 q

From Di

010 Δ
n 0 1 0 q

0010 Δ
n 0 0 1 0 q

Δ
n 0 q

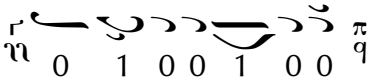
Δ
n 0 0 1 0 q

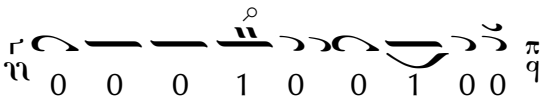
10010 Δ
n 1 0 0 1 0 q

100010 Δ
n 1 0 0 0 1 0 q


Accented on third to last syllable:


From Ga


0100100 

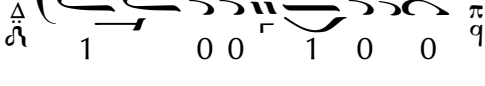
000100100 


From Di

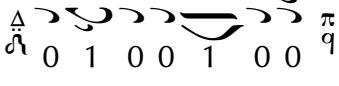
0100 

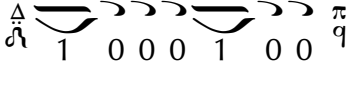
10100 

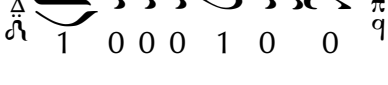
000100 

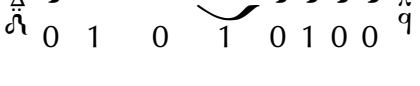
100100 




0100100 

1000100 



01010100 

10100100 

Grave Mode - Heirmologic

100100100 $\overset{\Delta}{\underset{\text{di}}{\text{A}}} \text{ } \overbrace{1} \text{ } \overbrace{00} \text{ } \overbrace{1} \text{ } \overbrace{00} \text{ } \overbrace{1} \text{ } \overbrace{00} \text{ } \overset{\pi}{\underset{\text{q}}{\text{q}}}$

Accented on fourth to last syllable:

From Di

01010 $\overset{\Delta}{\underset{\text{di}}{\text{A}}} \text{ } \overbrace{0} \text{ } \overbrace{10} \text{ } \overbrace{1} \text{ } \overbrace{0} \text{ } \overset{\pi}{\underset{\text{q}}{\text{q}}}$

B) Medial Cadences on Ga

Accented on last syllable:

From Ga

00 ṛ̇ — 0 0 ṛ̇

000 ṛ̇ — 0 — 0 — 0 — 0 ṛ̇

From Di

0 Δ̇ ṛ̇ — 0 ṛ̇

00 Δ̇ ṛ̇ — 0 0 ṛ̇

000 Δ̇ ṛ̇ — 0 — 0 — 0 ṛ̇

00001 Δ̇ ṛ̇ — 0 0 0 0 — 1 ṛ̇

10001 Δ̇ ṛ̇ — 1 — 0 0 0 — 1 ṛ̇

010001 Δ̇ ṛ̇ — 0 — 1 — 0 0 0 — 1 ṛ̇

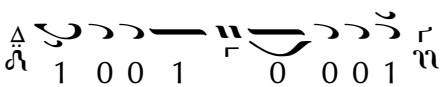
100001 Δ̇ ṛ̇ — 1 — — 0 0 0 0 — 1 ṛ̇

0010001 Δ̇ ṛ̇ — 0 0 — 1 — 0 0 0 — 1 ṛ̇

0100001 Δ̇ ṛ̇ — 0 — 1 — 0 0 0 0 — 1 ṛ̇

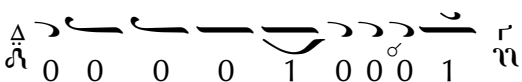
1000001 Δ̇ ṛ̇ — 1 — — — 0 0 0 0 — 1 ṛ̇

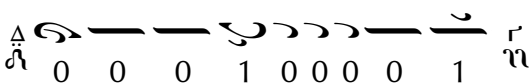
Grave Mode - Heirmologic

10010001 



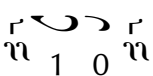


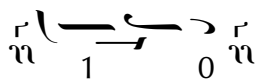
000010001 

000100001 

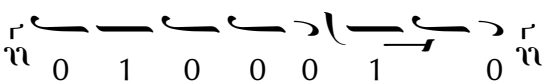
Accented on second to last syllable:

From Ga

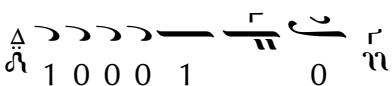
10 

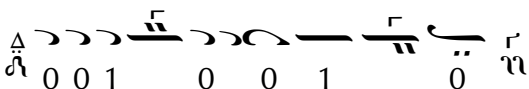


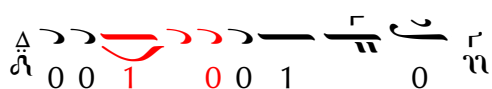
0010010 

0100010 

From Di

100010 

0010010 





Grave Mode - Heirmologic

10X00010		
000010010		
001000010		
100000010		
10X000010		
100010010		
100100010		
101000010		
101010010		
10X0000010		
1000100010		
00001000010		

Grave Mode - Heirmologic

10001000010 $\overset{\Delta}{\mathfrak{A}} \underbrace{\curvearrowright}_{1} \curvearrowright \curvearrowright \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \mathfrak{A}$

Accented on third to last syllable:

From Ga

100 $\mathfrak{A} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \mathfrak{A}$

$\mathfrak{A} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \mathfrak{A}$

$\mathfrak{A} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \mathfrak{A}$

0100 $\mathfrak{A} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \mathfrak{A}$

100100 $\mathfrak{A} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \mathfrak{A}$

10000100 $\mathfrak{A} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \mathfrak{A}$

From Di

0100 $\overset{\Delta}{\mathfrak{A}} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \mathfrak{A}$

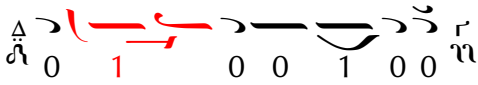

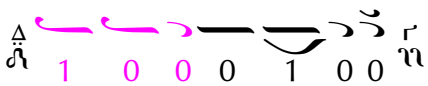
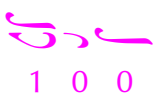
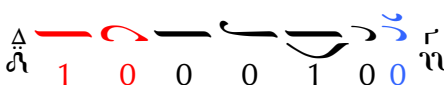


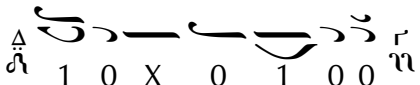
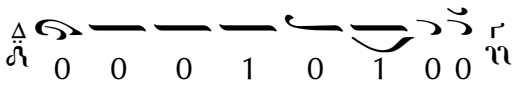
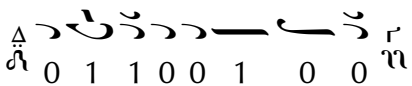
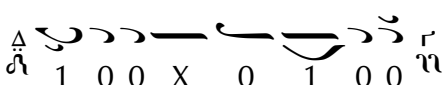
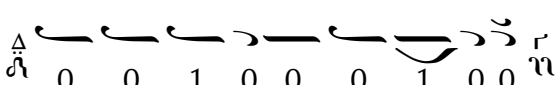
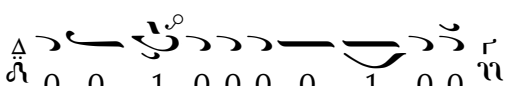
00100 $\overset{\Delta}{\mathfrak{A}} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \mathfrak{A}$

000100 $\overset{\Delta}{\mathfrak{A}} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \mathfrak{A}$

100100 $\overset{\Delta}{\mathfrak{A}} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \mathfrak{A}$

0010100 $\overset{\Delta}{\mathfrak{A}} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{1} \underbrace{\curvearrowright}_{0} \underbrace{\curvearrowright}_{0} \mathfrak{A}$

Grave Mode - Heirmologic

0100100		
1000100		
		
		
		
10X0100		
00010100		
01100100		
100X0100		
001000100		
0010000100		

Accented on fourth to last syllable:

From Ga

0101010	
---------	---

Grave Mode - Heirmologic

01001010

n 0 1 0 0 1 0 1 0 n

010001001

10001001010

1 0 0 0 1 0 0 1 0 1 0

From Di

01001

Δ
 α 0 1 0 0 1 η

1

01100

001001

$$\begin{array}{cc} \rightarrow & \rightarrow \\ 0 & 0 \end{array}$$

001100

0001001

Δ

0 0 0 1 0 0 1

r

Δ

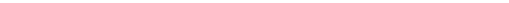
0 0 0 1 0 0 1

010X010

$$1001001 \quad \overset{\Delta}{\underset{\delta}{\curvearrowright}} \overset{\curvearrowright}{1} \overset{\curvearrowright}{0} \overset{\curvearrowright}{0} \overset{\curvearrowright}{1} \overset{\curvearrowright}{0} \overset{\curvearrowright}{0} \overset{\curvearrowright}{1} \overset{\curvearrowright}{r}$$

100X010

01001010

$\overset{\Delta}{\underset{\Delta}{a}}$

 $\overset{\Gamma}{\underset{\Gamma}{n}}$

0 1 0 0 1 0 1 0

Grave Mode - Heirmologic

10001010

Δ
 \mathfrak{A}

 1 0 0 0 1 0 1 0

10X01010

10101010

100001010

Δ
 δ

[illegible]

101001010

10X001010

0010001010

$\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$
 $\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$

0 0 1 0 0 0 1 0 1 0

C) Medial Cadences on Di

Accented on last syllable:

From Pa

$$00 \quad \pi_q \frac{1}{0} \frac{1}{0} \frac{\Delta}{\mathfrak{A}}$$
$$00001 \quad \pi_q \begin{array}{c} \overbrace{}^{\curvearrowright} \\ 0 \end{array} \begin{array}{c} \overbrace{}^{\curvearrowleft} \\ 0 \end{array} \begin{array}{c} \overline{} \\ 0 \end{array} \begin{array}{c} \overline{} \\ 0 \end{array} \begin{array}{c} \overline{} \\ 1 \end{array} \Delta_{\tilde{\mathfrak{A}}}.$$

010001

π_q 0 1 0 0 0 1 $\frac{\Delta}{\delta}$

0100001

π_q 0 1 0 0 0 0 1 $\Delta_{\tilde{q}}$

From Ga

$$0 \quad \overline{n_0} \quad \Delta \ddot{a}$$
$$0000 \quad \overbrace{0}^r \quad \overbrace{0}^r \quad \overbrace{0}^r \quad \overbrace{0}^r \quad \overbrace{\Delta}^r$$
[illegible]
$$\begin{array}{ccccccc} \text{r} & \text{r} & \text{r} & \text{r} & \text{r} & \text{r} & \text{r} \\ \text{n} & 0 & 0 & 1 & \Delta & & \\ & & & & \text{a} & & \end{array}$$

0001

$\begin{matrix} \text{r} \\ \text{n} \end{matrix} \begin{matrix} \text{0} & \text{0} & \text{0} & \text{1} \end{matrix} \begin{matrix} \Delta \\ \mathfrak{A} \end{matrix}$

$$\begin{array}{ccccccc} \Gamma & \hookrightarrow & \hookrightarrow & \hookrightarrow & \hookrightarrow & \hookrightarrow & \Delta \\ \mathfrak{u} & 0 & 0 & 0 & 1 & & \mathfrak{a} \end{array}$$

10001

010001

$\overline{0} \quad \overline{1} \quad \overline{0} \quad \overline{0} \quad \overline{0} \quad \overline{1} \quad \overline{\Delta}$

1

Grave Mode - Heirmologic

100001	
0010001	
0100001	
01010001	
000100001	

From Di

00

000

0001

00001

Grave Mode - Heirmologic

1

1

$$\frac{1}{2}$$

Grave Mode - Heirmologic

000010001 $\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\curvearrowleft} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\quad} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 0 0 0 1 0 0 0 1

010100001 $\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\circ} \overbrace{\quad}^{\curvearrowleft} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\curvearrowright} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 1 0 1 0 0 0 0 1

Accented on second to last syllable:

From Pa

10 $\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \overbrace{\quad}^{\curvearrowright} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 1 0

$\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \overbrace{\quad}^{\curvearrowright} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 1 0

010 $\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\overline{\quad}} \overbrace{\quad}^{\quad} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 1 0

0X010 $\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\quad} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 X 0 1 0

00010 $\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\overline{\quad}} \overbrace{\quad}^{\quad} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 0 0 1 0

000010 $\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 0 0 0 1 0

0010010 $\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \overbrace{\quad}^{\curvearrowleft} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\circ} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\overline{\quad}} \overbrace{\quad}^{\quad} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 0 1 0 0 1 0

$\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\overline{\quad}} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\quad} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 0 1 0 0 1 0

0100010 $\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\curvearrowright} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overbrace{\quad}^{\quad} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 0 1 0 0 0 1 0

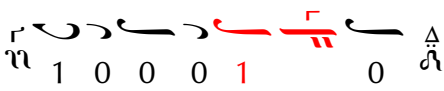

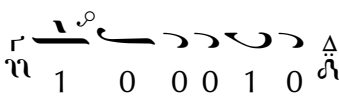
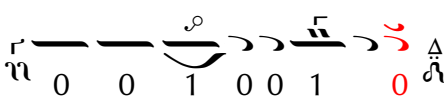

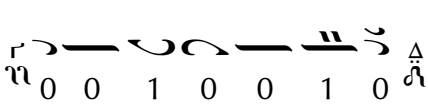
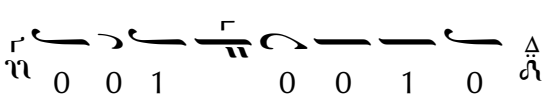
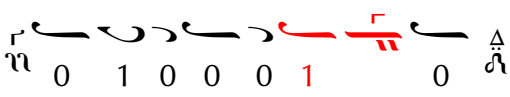

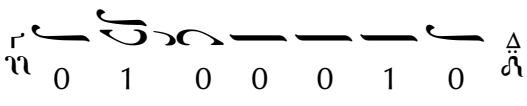
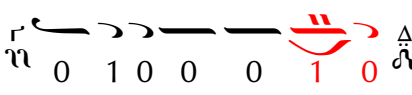

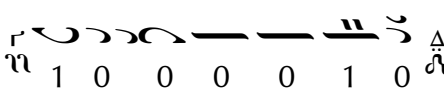
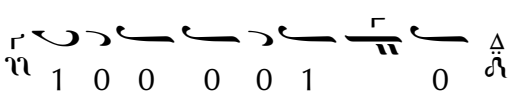
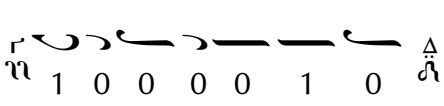

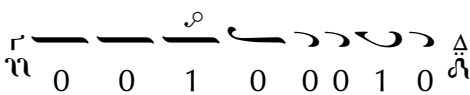
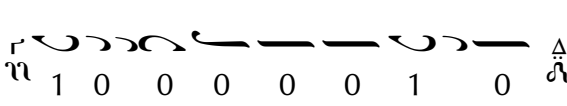
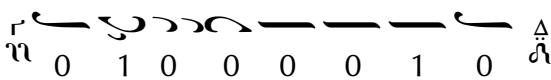
From Ga

10 $\overset{\overline{\quad}}{\underset{\cdot}{\mathfrak{n}}} \overbrace{\quad}^{\quad} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
 1 0

Grave Mode - Heirmologic

010		
0010		
00010		
10010		
00X010		

Grave Mode - Heirmologic

100010		
		
0010010		
		
		
0100010		
		
		
1000010		
		
		
1010010		
00100010		
10000010		
01000010		

Grave Mode - Heirmologic

10010010

From Di

10

010

0010

00010

Grave Mode - Heirmologic

10010

Δ Δ
0 0 0 1 0 Δ

Δ Δ
1 0 0 1 0 Δ

1 0

Δ Δ
1 0 0 1 0 Δ

Δ Δ
1 0 0 1 0 Δ

Δ Δ
1 0 0 1 0 Δ

Δ Δ
1 0 0 1 0 Δ

000010

Δ Δ
0 0 0 0 1 0 Δ

1 0

Δ Δ
0 0 0 0 1 0 Δ

010010

Δ Δ
0 1 0 0 1 0 Δ

1 0

Δ Δ
0 1 0 0 1 0 Δ

1

Δ Δ
0 1 0 0 1 0 Δ

Δ Δ
0 1 0 0 1 0 Δ

Δ Δ
0 1 0 0 1 0 Δ

Δ Δ
0 1 0 0 1 0 Δ

Grave Mode - Heirmologic

100010

1 0 0 0 1 0

1 0 0 0 1 0

1 0

1 0 0 0 1 0

1 0 0 0 1 0

1 0 0 0 1 0

0010010

0 0 1 0 0 1 0

0 0 1 0 0 1 0

0100010

0 1 0 0 0 1 0

0 1 0 0 0 1 0

1

0 1 0 0 0 1 0

0

0 1 0 0 0 1 0

010X010

0 1 0 X 0 1 0

1000010

1 0 0 0 0 1 0

1 0

1 0 0 0 0 1 0

Grave Mode - Heirmologic

	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{ — } \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \text{ — } \text{ — } \text{ — } \overset{\curvearrowleft}{\text{ — }} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
	1 0 0 0 0 1 0
00100010	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{ — } \overset{\curvearrowleft}{\text{ — }} \text{ — } \overset{\curvearrowleft}{\text{ — }} \text{ — } \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
	0 0 1 0 0 0 1 0
01000010	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{ — } \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \text{ — } \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
	0 1 0 0 0 0 1 0
0101000010	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{ — } \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \text{ — } \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
	0 1 0 1 0 0 0 0 1 0

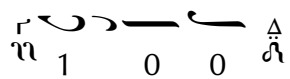
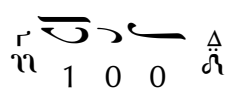
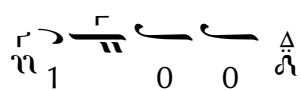
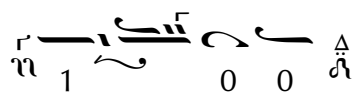
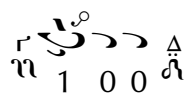
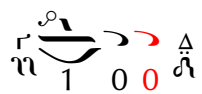
Accented on third to last syllable:

From Pa

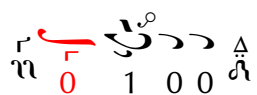
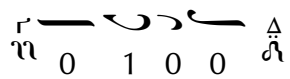
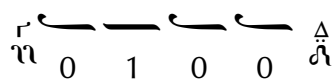
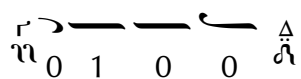
100	$\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
	1 0 0
	$\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
	1 0 0
	$\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
	1 0 0
00100	$\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \text{ — } \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
	0 0 1 0 0
	$\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
	0 0 1 0 0
00101	$\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \text{ — } \overset{\curvearrowright}{\text{ — }} \text{ — } \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
	0 0 1 0 1
0000100	$\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
	0 0 0 0 1 0 0
0010000100	$\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \text{ — } \text{ — } \overset{\curvearrowright}{\text{ — }} \overset{\curvearrowright}{\text{ — }} \text{ — } \text{ — } \text{ — } \overset{\curvearrowright}{\text{ — }} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$
	0 0 1 0 0 0 0 1 0 0

From Ga

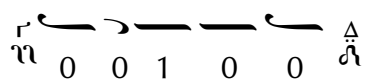
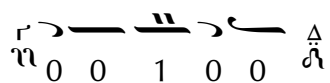
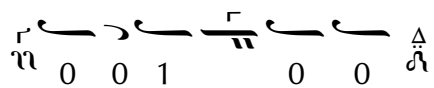
100

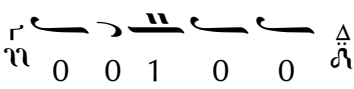
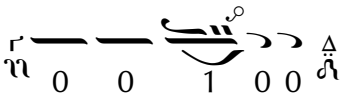


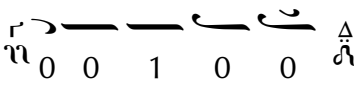
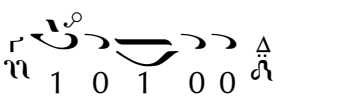
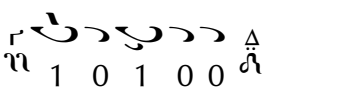
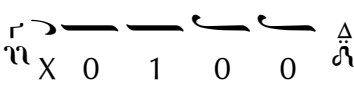
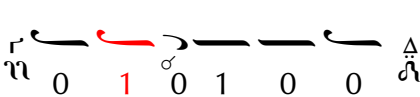

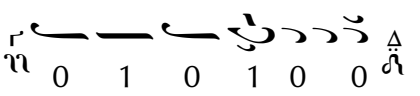



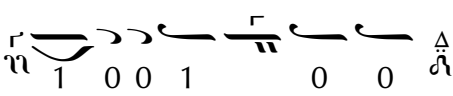

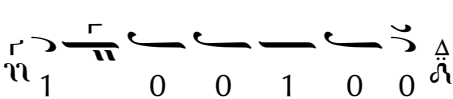


0100



00100



		
		
		
		
10100		
		
X0100		
010100		
		
		
100100		
		
		
		

Grave Mode - Heirmologic

0100100

1000100

00010100

00100100

01000100

001000100

100000100

Grave Mode - Heirmologic

1000100100

10010X0100

From Di

100

100

100

100

100

100

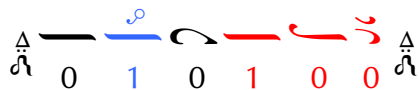
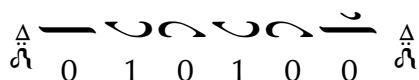
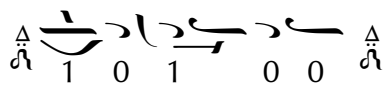
100

10X

0100

0100

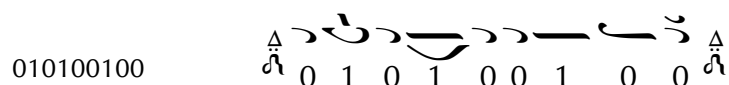
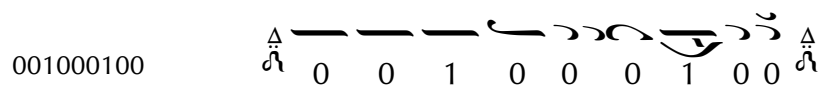
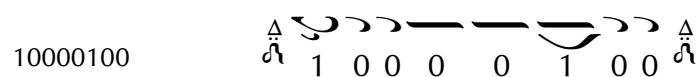
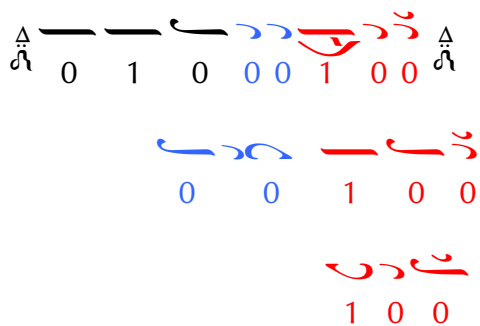
Grave Mode - Heirmologic


$$\begin{array}{ccccccccc} \Delta & & & & & & & & \Delta \\ \downarrow & \curvearrowright & \text{---} & \text{---} & \curvearrowleft & \curvearrowleft & & & \downarrow \\ \mathfrak{d} & 0 & 0 & 1 & 0 & 0 & & & \mathfrak{d} \end{array}$$
$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \text{A} & & & & & & \text{A} \\ 1 & & 0 & & 1 & & 0 & & 0 \end{array}$$


Grave Mode - Heirmologic

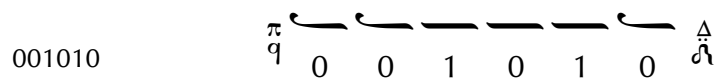
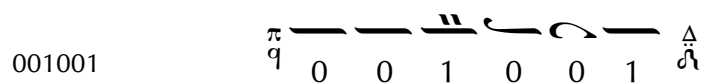
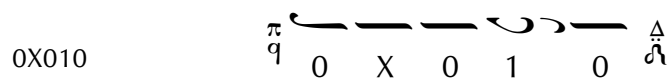
100100			
0010100			
0100100			
01X0101			
0110100			
1000100			
1000101			
00100100			
01000100			

Grave Mode - Heirmologic

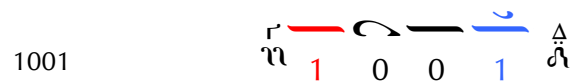
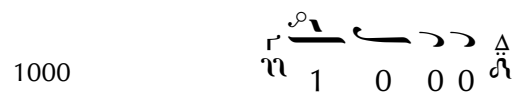


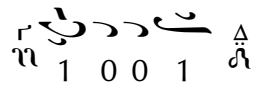
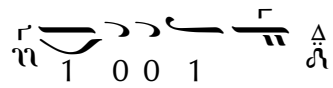
Accented on fourth to last syllable:

From Pa

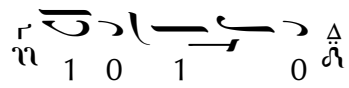
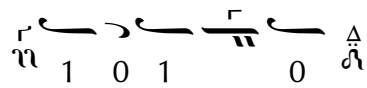


From Ga

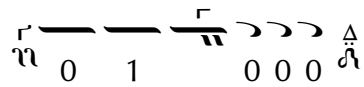




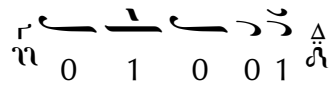
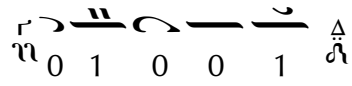
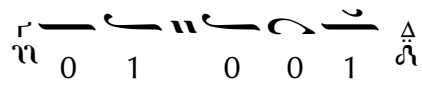
1010



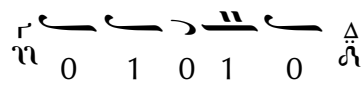
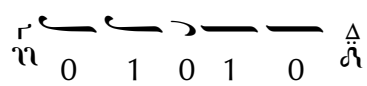
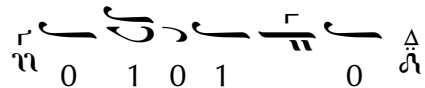
01000



01001



01010

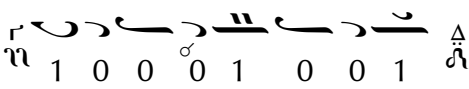
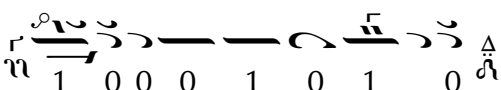
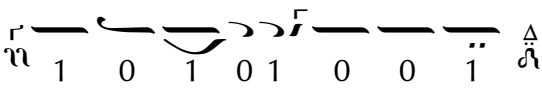
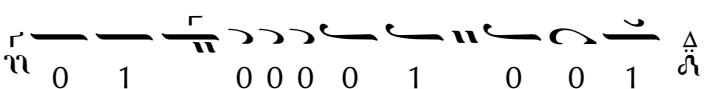


01100

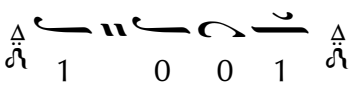
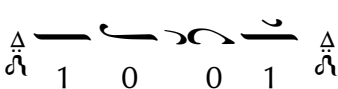
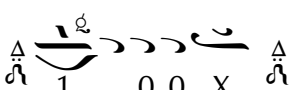
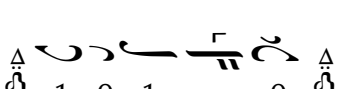
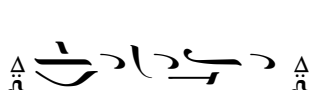
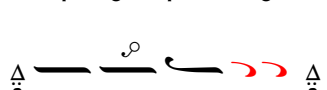
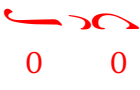
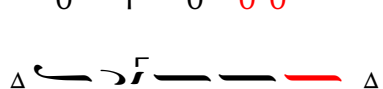

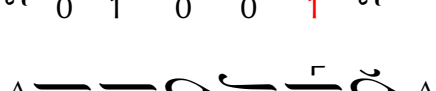
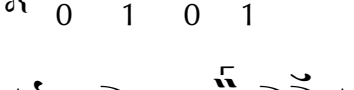


001000		
001001		
001010		
101000		
0001000		
0001010		
1001000		
1001010		
100X010		
01001001		
10001001		

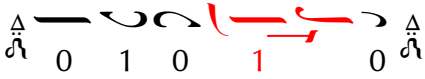



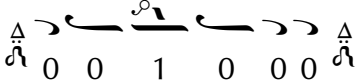
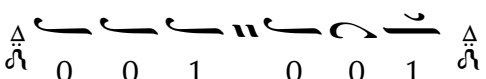
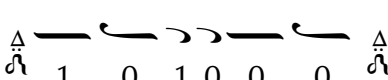
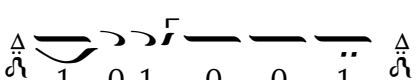
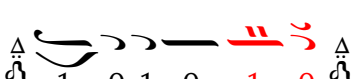


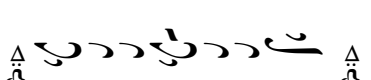
Grave Mode - Heirmologic

	
10001010	
10101001	
0100001001	

From Di

1001		
		
100X		
1010		
		
01000		
01001		
01010		
		

Grave Mode - Heirmologic

		
01X00		
001000		
001001		
101000		
101001		
101010		
0001010		
1001X00		

D) Formulae with Fthoras

Accented on last syllable:

10001 $\overset{\text{r}}{\underset{\text{r}}{\text{A}}} \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \overset{\text{r}}{\underset{\text{r}}{\text{A}}}$
 1 0 0 0 1

10001 $\overset{\text{r}}{\underset{\text{r}}{\text{A}}} \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \overset{\text{r}}{\underset{\text{r}}{\text{A}}}$
 1 0 0 0 1

Accented on second to last syllable:

010 $\overset{\text{r}}{\underset{\text{r}}{\text{A}}} \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \overset{\text{r}}{\underset{\text{r}}{\text{A}}}$
 0 1 0

0000010 $\overset{\text{r}}{\underset{\text{r}}{\text{A}}} \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \overset{\text{r}}{\underset{\text{r}}{\text{A}}}$
 0 0 0 0 0 1 0

Accented on fourth to last syllable:


01010 $\overset{\text{r}}{\underset{\text{r}}{\text{A}}} \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \text{ — } \overset{\text{r}}{\underset{\text{r}}{\text{A}}}$
 0 1 0 1 0

E) Ending Formulae

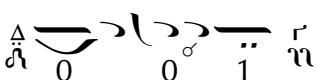
Note: Formulae from section B (pages 746-753) may also be used as ending formulae if the phrase is accented on the second to last or fourth to last syllable.


Accented on last syllable:


From Ga

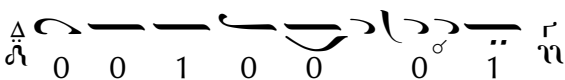
1010X01 

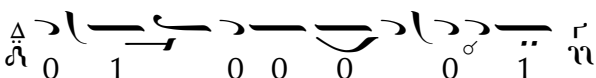
From Di


001 

100001 

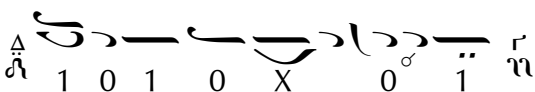
0000001 

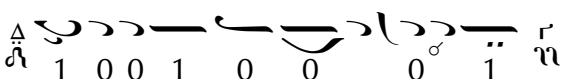
0010001 

0100001 

1000001 




1010X01 

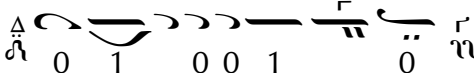
10010001 


Accented on second to last syllable:

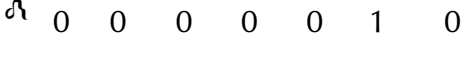
From Di

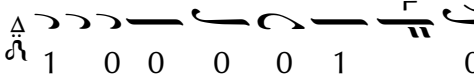
Grave Mode - Heirmologic


000010 

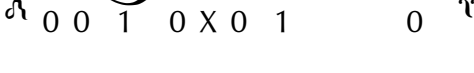
010010 

0000010 

1000010 

0010X010 

100100010 

1000100010 

Accented on third to last syllable:

From Di

100

100100

0000100

0010100

12

Grave Mode - Heirmologic

0100100

1000100

1010100

10X0100

10000100

10010100

Accented on fourth to last syllable:

From Di

1001010

Grave Mode - Heirmologic

0010X010

$$\begin{array}{ccccccccccccccc} \Delta & \frown & \frown & \smile & \frown & \frown & \frown & \text{---} & \frac{\Gamma}{\parallel} & \smile & \Gamma \\ \delta & 0 & 0 & 1 & 0 & \times & 0 & 1 & & 0 & \eta \end{array}$$

F) Endings for Theotokia*

Accented on last syllable:

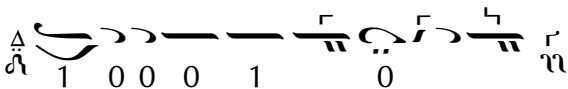
(A 100 or 1001 formula may also be appropriate.)


10001 

Accented on second to last syllable:

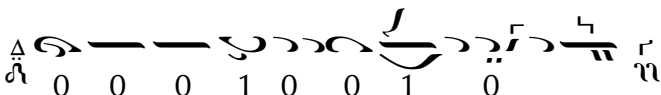
From Di

10010 

100010 

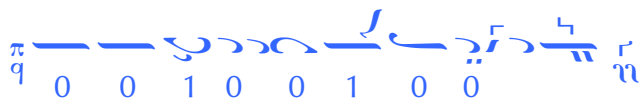
1000010 

0010010 

00010010 

Accented on third to last syllable:

From Pa

00100100 

* The formulae in blue in this section are from the Athonite oral tradition, as represented in the book *Παρακλητικῆς, Μουσικὸν Ἐγκόλπιον, Πλάγιοι Ἦχοι, Ἱεροθέου Ἱερομονάχου*, ἐκδόσεις Ἱ.Μ. Φιλοθέου, Ἁγίου Ὁρους, 2004. The first formula on this page (in pink) is from the Rumanian *Anastasimatarul* by Dimitrie Suceveanu, Sfintei Monastiri Neamțu, 1943.

Grave Mode - Heirmologic


From Ga

0100010X



From Di

0100


00100


010100


100100


1000100


0100010X




Accented on fourth to last syllable:

From Di

01001


101001




BYZANTINE MUSIC FORMULAE

Grave Mode - Protovarys (Heirmologic)

Contents^{*}

A) Cadences on Zo	783
B) Medial Cadences on Pa	787
C) Medial Cadences on Ga	790
D) Medial Cadences on Di	791
E) Medial Cadences on Ke	799
F) Formulae with Fthoras	801
G) Endings for Theotokia	802

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

* The Byzantine music formulae herein were extracted from the heirmologic protovarys doxology in the Zoe *Anastasimatarion* (14th edition, 2002) and from the vesper verses of Psalms 140, 141, 129, and 116 in the *Anastasimatarion Neon* (1853 edition). The latter contains the troparia of grave mode composed "kata to pentaphonon" by Georgios the Kres (d. 1816), as transcribed from the old notation by Z. Zapheiropoulos (d. 1851). Although this list of formulae is incomplete due to the limited number of sources, one may usually fill in the gaps with heirmologic first mode formulae, because protovarys and first mode have many similarities.

A) Cadences on Zo

Accented on last syllable:

From Pa

0001 π
q 0 0 0 1 \sim

Δ
d 0 0 0 1 \sim

010001 π
q 0 1 0 0 0 1 \sim

\sim
1

From Di

100100001 Δ
d 1 0 0 1 0 0 0 0 1 \sim

100001000001 Δ
d 1 0 0 0 0 1 0 0 0 0 0 1 \sim

0100010001 Δ
d 0 1 0 0 0 1 0 0 0 1 \sim

According to the musicologist Ioannis Arvanitis, Zapheiroopoulos intentionally used the omalon in this and other formulae to denote the sound of the oxeia, even though it is orthographically incorrect to join two different syllables with an omalon

Accented on second to last syllable:

From Pa

010 π
q 0 1 0 \sim

0010 π
q 0 0 1 0 \sim

Grave Mode - Protovarys (Heirmologic)

00010 π
q 0 0 0 1 0 π
0 0 0 1 0 π

π
q 0 0 0 1 0 π

010010 π
q 0 1 0 0 1 0 π
0 1 0 0 1 0 π

π
0

100010 π
q 1 0 0 0 1 0 π

10X010 π
q 1 0 X 0 1 0 π

0100010 π
q 0 1 0 0 0 1 0 π

00010010 π
q 0 0 0 1 0 0 1 0 π

From Ga

10010010 π
q 1 0 0 1 0 0 1 0 π

From Di

100100010 π
q 1 0 0 1 0 0 0 1 0 π

0010100010 π
q 0 0 1 0 1 0 0 0 1 0 π

01000010010 π
q 0 1 0 0 0 0 1 0 0 1 0 π

Accented on third to last syllable:

From Pa

Grave Mode - Protovars (Heirmologic)

100

[illegible]

110

$$\pi_q \begin{array}{ccccc} \cup & \cup & \cap & \cup & \cup \\ 1 & 1 & & 0 & \cup \end{array} z$$

0100

$$\pi_q \circ \bigcup_{i=0}^3 \gamma_i \circ z$$
$$\pi_q \rightarrow \begin{array}{c} \text{---} \overline{\text{---}} \text{---} \\ \text{0} \quad \text{1} \end{array} \rightarrow \begin{array}{c} \text{---} \text{---} \\ \text{0} \quad \text{0} \end{array} \rightarrow z$$

From Di

00100

0 0 1 0 0

11100

$$\frac{\Delta}{d_0} \underbrace{\quad}_1 \rightsquigarrow \underbrace{\quad}_1 \overline{\quad} \overline{\quad} \overline{\quad} \rightsquigarrow \underbrace{\quad}_1 \overline{\quad} \overline{\quad} \overline{\quad} \rightsquigarrow \underbrace{\quad}_0 \overline{\quad} \overline{\quad} \overline{\quad} \rightsquigarrow \underbrace{\quad}_0 \overline{\quad} \overline{\quad} \overline{\quad} \rightsquigarrow \underbrace{\quad}_1 \overline{\quad} \overline{\quad} \overline{\quad} \rightsquigarrow \underbrace{\quad}_2 \overline{\quad} \overline{\quad} \overline{\quad}$$

0010100

$$\begin{array}{ccccccc} \Delta & \curvearrowright & \text{---} & \cup & \cup & \cup & \cup \\ \mathfrak{A} & 0 & 0 & 1 & 0 & 1 & 0 & 0 & z \end{array}$$

0000100

1 0 0

1000100

$$\begin{array}{ccc} \text{1} & \text{0} & \text{0} \\ \hline \end{array}$$

01000100

$$\overset{\Delta}{\mathfrak{A}}_0 \curvearrowright 1 \curvearrowright 0 \curvearrowright 0 \curvearrowright 1 \curvearrowright 0 \curvearrowright 0 \curvearrowright z$$

01 100100

$$\begin{array}{cccccccc} \Delta & \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \overline{\curvearrowright} & \curvearrowright & \curvearrowright & z \\ \partial & 0 & 1 & 1 & 0 & 0 & 1 & 0 & 0 \end{array}$$

001000100

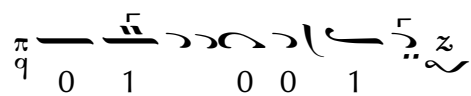
$$\begin{array}{cccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & z \\ \partial & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \\ & 0 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 0 \end{array}$$

Accented on fourth to last syllable:

From Pa

Grave Mode - Protovarys (Heirmologic)

01001



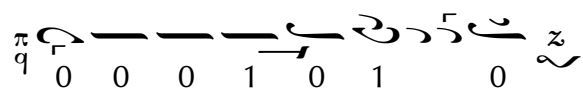
01010



0001001

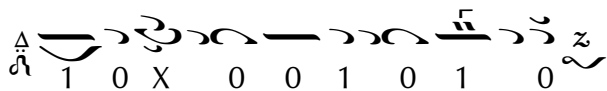


0001010



From Di

10X001010



B) Medial Cadences on Pa

Accented on last syllable:

From Pa

00 $\pi \begin{array}{c} \curvearrowright \\ \text{q} \end{array} \overline{\text{0}} \text{0} \pi \begin{array}{c} \text{q} \end{array}$

000 $\pi \begin{array}{c} \curvearrowright \\ \text{q} \end{array} \overline{\text{0}} \text{0} \overline{\text{0}} \pi \begin{array}{c} \text{q} \end{array}$

Accented on second to last syllable:

From Zo

00011 $\pi \begin{array}{c} \text{z} \\ \text{q} \end{array} \overline{\text{0}} \overline{\text{0}} \overline{\text{0}} \overline{\text{1}} \overline{\text{1}} \pi \begin{array}{c} \text{q} \end{array}$

From Pa

10 $\pi \begin{array}{c} \text{r} \\ \text{q} \end{array} \overline{\text{1}} \overline{\text{0}} \pi \begin{array}{c} \text{q} \end{array}$

From Ga

10010 $\pi \begin{array}{c} \text{r} \\ \text{q} \end{array} \overline{\text{1}} \overline{\text{0}} \overline{\text{0}} \overline{\text{1}} \overline{\text{0}} \pi \begin{array}{c} \text{q} \end{array}$

From Di

10 $\Delta \begin{array}{c} \text{r} \\ \text{q} \end{array} \overline{\text{1}} \overline{\text{0}} \pi \begin{array}{c} \text{q} \end{array}$

11 $\Delta \begin{array}{c} \text{r} \\ \text{q} \end{array} \overline{\text{1}} \overline{\text{1}} \pi \begin{array}{c} \text{q} \end{array}$

010 $\Delta \begin{array}{c} \text{r} \\ \text{q} \end{array} \overline{\text{0}} \overline{\text{1}} \overline{\text{0}} \pi \begin{array}{c} \text{q} \end{array}$

0110 $\Delta \begin{array}{c} \text{r} \\ \text{q} \end{array} \overline{\text{0}} \overline{\text{1}} \overline{\text{1}} \overline{\text{0}} \pi \begin{array}{c} \text{q} \end{array}$

Grave Mode - Protovarys (Heirmologic)

00010 $\overset{\Delta}{\mathfrak{A}} \curvearrowright \text{---} \text{---} \text{---} \text{---} \text{---} \pi_q$
0 0 0 1 0

$$\begin{array}{ccccccccc} \Delta & \curvearrowright & \text{---} & \curvearrowright & \text{---} & \text{---} & \curvearrowright & \curvearrowright & \pi q \\ \delta & 0 & 0 & 0 & 1 & 0 & & & \end{array}$$

10010

$\frac{\Delta}{\hbar}$ $\frac{\pi}{q}$

1 0 0 1 0

1 0

010010

0 1 0 0 1 0

πq

$$\begin{array}{ccccccc} \Delta & \curvearrowright & \cup & \curvearrowright & \text{---} & \curvearrowleft & \pi \\ \delta & 0 & 1 & 0 & 0 & 1 & q \end{array}$$

1000010


Δ
 δ 1 0 0 0 0 1 0 πq

0100010

Δ
 \mathcal{A}

0 1 0 1 0 0 1 0

π
 q

000100010 $\overset{\Delta}{\underset{\delta}{\mathcal{A}}}$  π_q

Accented on third to last syllable:

From Pa

0100 $\pi_q \overline{}_0 \overline{}_1 \overline{}_0 \overline{}_0 \pi_q$

From Di

100

$\Delta_{\text{A}} \xrightarrow{\quad} \pi_9$

0100 $\overset{\Delta}{\underset{q}{d}} \rightsquigarrow 0 \quad 1 \quad 0 \quad 0 \quad \pi q$

$$\begin{array}{ccccccc} \Delta & & & & & & \\ \delta & \curvearrowright & \cup & \curvearrowright & \curvearrowright & & \pi \\ 0 & & 1 & & 0 & 0 & q \end{array}$$

Grave Mode - Protovarys (Heirmologic)

0110 $\overset{\Delta}{\underset{\text{d}}{\text{h}}} \overbrace{0 \ 1 \ 1}^{\text{grave}} \ 0 \ \overset{\pi}{\underset{\text{q}}{\text{q}}}$

00100 $\overset{\Delta}{\underset{\text{d}}{\text{h}}} \overbrace{0 \ 0}^{\text{grave}} \ \overbrace{1 \ 0 \ 0}^{\text{grave}} \ \overset{\pi}{\underset{\text{q}}{\text{q}}}$

000100 $\overset{\Delta}{\underset{\text{d}}{\text{h}}} \overbrace{0 \ 0 \ 0}^{\text{grave}} \ \overbrace{1 \ 0 \ 0}^{\text{grave}} \ \overset{\pi}{\underset{\text{q}}{\text{q}}}$

100100 $\overset{\Delta}{\underset{\text{d}}{\text{h}}} \overbrace{1 \ 0 \ 0}^{\text{grave}} \ \overbrace{1 \ 0 \ 0}^{\text{grave}} \ \overset{\pi}{\underset{\text{q}}{\text{q}}}$

$\overset{\Delta}{\underset{\text{d}}{\text{h}}} \overbrace{1 \ 0 \ 0}^{\text{grave}} \ \overbrace{1 \ 0 \ 0}^{\text{grave}} \ \overset{\pi}{\underset{\text{q}}{\text{q}}}$

0000100 $\overset{\Delta}{\underset{\text{d}}{\text{h}}} \overbrace{0 \ 0 \ 0 \ 0}^{\text{grave}} \ \overbrace{1 \ 0 \ 0}^{\text{grave}} \ \overset{\pi}{\underset{\text{q}}{\text{q}}}$

10000100 $\overset{\Delta}{\underset{\text{d}}{\text{h}}} \overbrace{1 \ 0 \ 0 \ 0}^{\text{grave}} \ \overbrace{0 \ 1 \ 0 \ 0}^{\text{grave}} \ \overset{\pi}{\underset{\text{q}}{\text{q}}}$

Accented on fourth to last syllable:

From Zo

1010 $\overset{\text{z}}{\underset{\text{z}}{\text{z}}} \overbrace{1 \ 0 \ 1}^{\text{grave}} \ 0 \ \overset{\pi}{\underset{\text{q}}{\text{q}}}$

From Di

1010 $\overset{\Delta}{\underset{\text{d}}{\text{h}}} \overbrace{1 \ 0 \ 1}^{\text{grave}} \ 0 \ \overset{\pi}{\underset{\text{q}}{\text{q}}}$

0001010 $\overset{\Delta}{\underset{\text{d}}{\text{h}}} \overbrace{0 \ 0 \ 0}^{\text{grave}} \ \overbrace{1 \ 0 \ 1}^{\text{grave}} \ 0 \ \overset{\pi}{\underset{\text{q}}{\text{q}}}$

C) Medial Cadences on Ga

Accented on second to last syllable:

010X010

A complex knot diagram with crossings and a label "010X010". The diagram features a central horizontal strand with several crossings. A crossing is labeled with a circled '0' and a circled '1'. The label "010X010" is positioned to the left of the diagram.

Accented on third to last syllable:

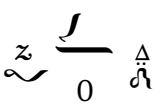
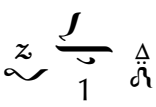
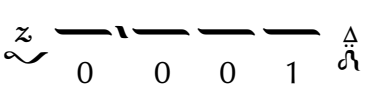
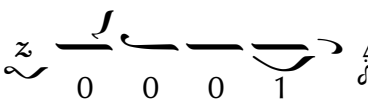
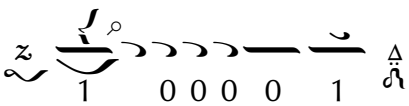


000100

δ_1^{Δ}
 δ_1^r

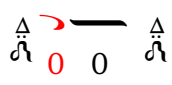
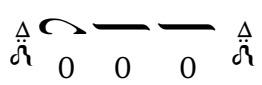
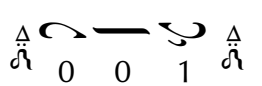
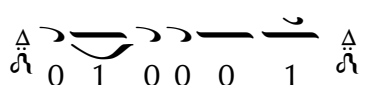
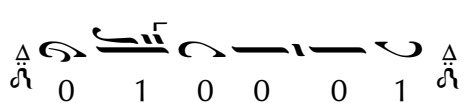
D) Medial Cadences on Di

Accented on last syllable:

From Zo

0	
1	
0001	
	
100001	
1000001	
100010001	

From Di

00	
000	
001	
010001	
	



Grave Mode - Protovarys (Heirmologic)

100001	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\text{f}}{\text{—}} \text{—} \text{—} \text{—} \text{—} \overset{\text{v}}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 1 0 0 0 0 1
010X0001	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{—} \overset{\circ}{\text{—}} \text{—} \text{—} \text{—} \text{—} \overset{\text{v}}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 0 1 0 X 0 0 0 1
	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{—} \overset{\circ}{\text{—}} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\text{v}}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 0 1 0 X 0 0 0 1
100010001	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\circ}{\text{—}} \text{—} \text{—} \text{—} \overset{\circ}{\text{—}} \text{—} \text{—} \text{—} \overset{\text{v}}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 1 0 0 0 1 0 0 0 1
1010100001	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\text{f}}{\text{—}} \text{—} \text{—} \text{—} \overset{\text{v}}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 1 0 1 0 1 0 0 0 0 1

Accented on second to last syllable:

From Zo

10	$\overset{\text{z}}{\text{—}} \overset{\text{f}}{\text{—}} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 1 0
0010	$\overset{\text{z}}{\text{—}} \text{—} \text{—} \overset{\text{f}}{\text{—}} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 0 0 1 0

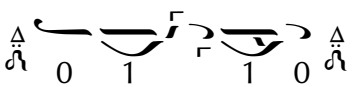
From Pa


0010	$\overset{\pi}{\underset{\cdot}{\mathfrak{q}}} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 0 0 1 0
------	---

From Di

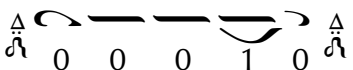
10	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{—} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 1 0
	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \overset{\text{f}}{\text{—}} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 1 0
010	$\overset{\Delta}{\underset{\cdot}{\mathfrak{A}}} \text{—} \text{—} \overset{\text{f}}{\text{—}} \text{—} \overset{\Delta}{\underset{\cdot}{\mathfrak{A}}}$ 0 1 0

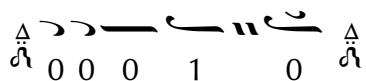
Grave Mode - Protovarys (Heirmologic)

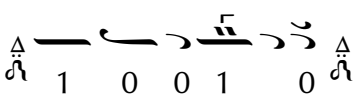
011 

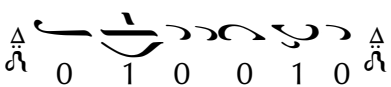
0010 

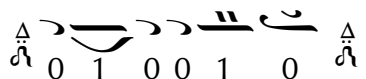

1

00010 

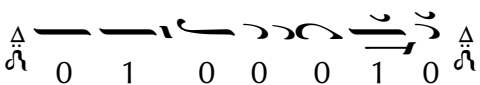


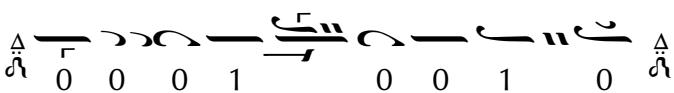
10010 

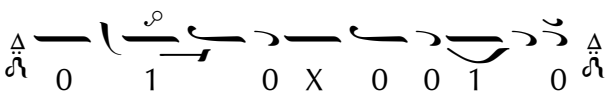
010010 

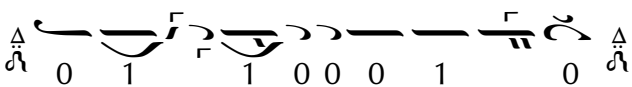


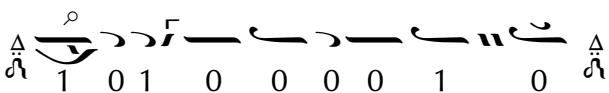
110010 

0100010 

00010010 

010X0010 

01100010 

101000010 

0001000010 

Grave Mode - Protovarys (Heirmologic)

From Ke

100010

Accented on third to last syllable:

From Zo

100

0100

00100

100100

0100100

100X100

000X0100

100100100

101000100

From Di

Grave Mode - Protovars (Heirmologic)

100

$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \downarrow & & & & & & \downarrow \\ \text{A} & & & & & & \text{A} \\ | & & & & & & | \\ 1 & & 0 & 0 & & & 1 \end{array}$$
$$\begin{array}{ccccc} \Delta & \curvearrowright & \curvearrowright & \curvearrowright & \Delta \\ \text{A} & 1 & 0 & 0 & \text{A} \end{array}$$
$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \text{A} & & & & & & \text{A} \\ \text{A} & & & & & & \text{A} \\ 1 & & 0 & 0 & & & 1 \end{array}$$
$$\begin{array}{c} \Delta \\ \text{---} \end{array} \begin{array}{c} \Delta \\ \text{---} \end{array} \begin{array}{c} \Delta \\ \text{---} \end{array}$$

0100

A diagram of a 4-bit shift register. It consists of four flip-flops arranged horizontally. The inputs to the flip-flops are labeled 0, 1, 0, 0 from left to right. The output of the rightmost flip-flop is fed back to the input of the leftmost flip-flop. There are also feedback loops from the outputs of the second and third flip-flops to the input of the first flip-flop.

$$\begin{array}{ccccccc} \Delta & & \overline{\Delta} & & \Delta & & \Delta \\ \downarrow & & \downarrow & & \downarrow & & \downarrow \\ 0 & & 1 & & 0 & & 0 \end{array}$$

10100

$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \text{⌞} & \text{⌞} & \text{⌞} & \text{⌞} & \text{⌞} & \text{⌞} & \text{⌞} \\ & 1 & 0 & 1 & & 0 & 0 \end{array}$$

000100

010100

$$\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}} \curvearrowright \underset{0}{\mathfrak{A}} \underset{1}{\mathfrak{A}} \underset{0}{\mathfrak{A}} \underset{1}{\mathfrak{A}} \underset{0}{\mathfrak{A}} \underset{0}{\mathfrak{A}} \curvearrowright \overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$$

100100

110100


$$\overset{\Delta}{\underset{\text{A}}{\text{B}}} \quad \begin{array}{cccccc} \curvearrowright & - & \curvearrowleft & \curvearrowright & \curvearrowleft & \overset{\Delta}{\underset{\text{A}}{\text{B}}} \\ 1 & & 1 & 0 & 1 & 00 \end{array}$$

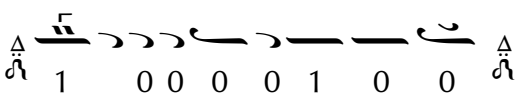
0000100

$$\begin{array}{ccccccc} \Delta & \curvearrowright & \text{---} & \text{---} & \overset{\circ}{\text{---}} & \curvearrowright & \Delta \\ \mathfrak{A} & & 0 & 0 & 1 & 0 & \mathfrak{A} \end{array}$$

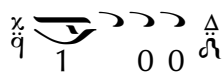
1

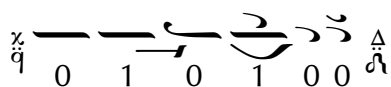
Grave Mode - Protovarys (Heirmologic)


01000100 

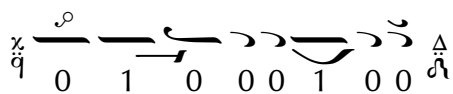
10000100 

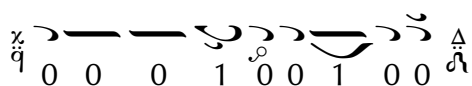
From Ke

100 

010100 


0100100 


01000100 

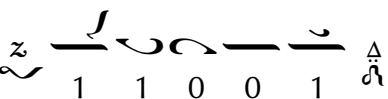
000100100 


Accented on fourth to last syllable:

From Zo

1001 

1010 

01001 

1001001 

From Di

Grave Mode - Protovarys (Heirmologic)

[illegible]

1100 $\overset{\Delta}{\mathfrak{A}} \frac{1}{1} \frac{2}{1} \frac{3}{00} \overset{\Delta}{\mathfrak{A}}$

01001

$\Delta_{\mathcal{A}}$

0 1 0 0 1 $\Delta_{\mathcal{A}}$

$$\begin{array}{ccccccc} \Delta & & & & & & \Delta \\ \text{♩} & \text{♩} & \text{♩} & \text{—} & \text{♩} & & \text{♩} \\ 0 & 1 & 0 & 0 & 1 & & \end{array}$$
$$\begin{array}{ccccccccc} \Delta & & & & & & & & \Delta \\ \text{A} & & & & & & & & \text{A} \\ 0 & 1 & 0 & 0 & 1 \end{array}$$

01010

0 1 0 1 0

1001001

1 0 0 1 0 0 1

Δ

1001010

Δ

1 0 0 1 0 1 0

00001010

Δ

0 0 0 0 1 0 1 0 Δ

10001010

Diagram illustrating a sequence of nodes (1, 0, 0, 0, 1, 0, 1, 0) connected by directed edges, representing a path or flow. The nodes are labeled with 1 and 0, and the edges are labeled with 1 and 0. The sequence starts and ends with a delta symbol (Δ).

1000001010

Δ
 Δ

1 0 0 0 0 0 1 0 1 0

10000101010

1 0 0 0 0 1 0 1 0 1 0

1010001010

Δ
 δ 1 0 1 0 0 0 1 0 1 0 Δ
 δ

From Ke

Grave Mode - Protovarys (Heirmologic)

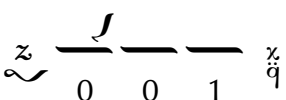
1010 $\begin{array}{c} \text{z} \\ \text{q} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \Delta \\ \text{a} \end{array}$
1 0 1 0

1001010 $\begin{array}{c} \text{z} \\ \text{q} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \text{---} \end{array} \begin{array}{c} \Delta \\ \text{a} \end{array}$
1 0 0 1 0 1 0

E) Medial Cadences on Ke

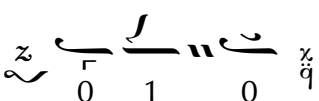
Accented on last syllable:

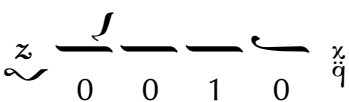
From Zo

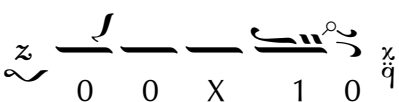
001 

Accented on second to last syllable:

From Zo

010 

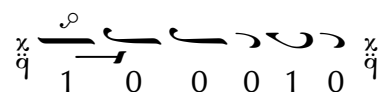
0010 

00X10 

From Di

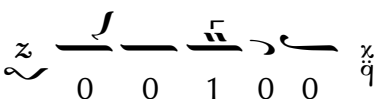
0010 

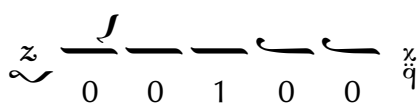
From Ke

100010 

Accented on third to last syllable:

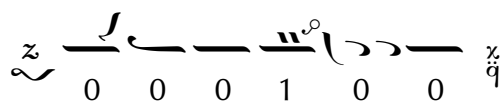
From Zo

00100 



Grave Mode - Protovarys (Heirmologic)

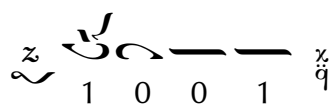
000100



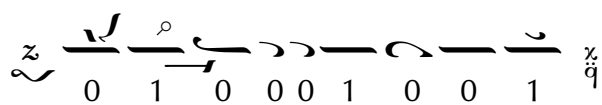
Accented on fourth to last syllable:

From Zo

1001



010001001



F) Formulae with Fthoras

Accented on last syllable:

From Di

10001 $\overset{\Delta}{\underset{\text{d}}{\text{h}}} \overset{\sigma}{\text{—}} \text{—} \text{—} \text{—} \overset{\sigma}{\text{—}} \overset{\Delta}{\underset{\sigma}{\text{—}}}$

100001 $\overset{\Delta}{\underset{\text{d}}{\text{h}}} \overset{\sigma}{\text{—}} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\sigma}{\text{—}} \overset{\Delta}{\underset{\sigma}{\text{—}}}$

Accented on second to last syllable:

From Zo

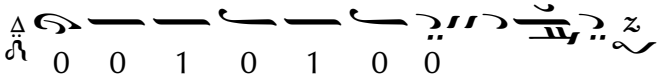
010 $\overset{\sigma}{\text{z}} \text{—} \text{—} \text{—} \text{—} \overset{\sigma}{\text{z}}$


Accented on fourth to last syllable:

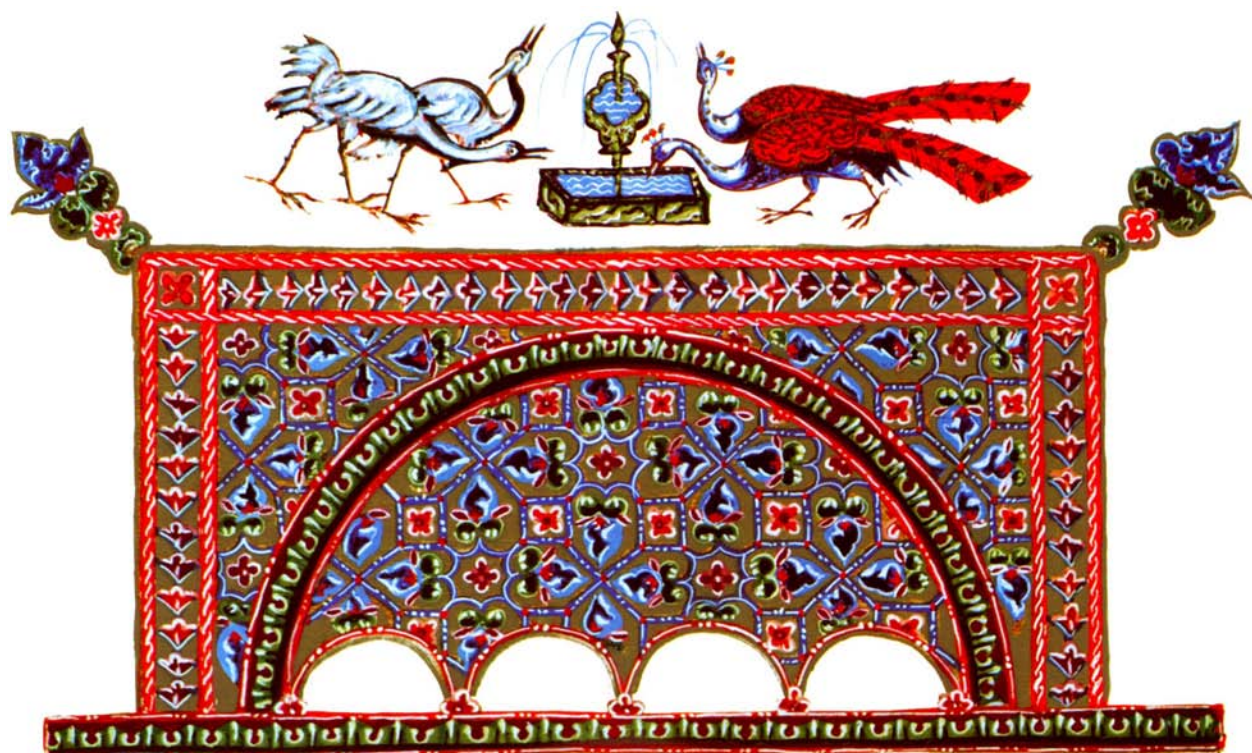
From Zo

10001010 $\overset{\sigma}{\text{z}} \overset{\sigma}{\text{—}} \overset{\sigma}{\text{—}} \text{—} \text{—} \text{—} \overset{\sigma}{\text{—}} \overset{\sigma}{\text{—}} \overset{\sigma}{\text{—}} \overset{\sigma}{\text{z'}}$

G) Endings for Theotokia

0010100 

00001001 



Plagal Fourth Mode



BYZANTINE MUSIC FORMULAE

Plagal Fourth Mode - Sticheraric

Contents*

<u>Medial Cadences on Nee</u>	
A) Accented on Last Syllable	806
B) Accented on Second to Last Syllable	808
C) Accented on Third to Last Syllable	812
D) Accented on Fourth to Last Syllable	816
<u>Medial Cadences on Vou</u>	
E) Accented on Last Syllable	819
F) Accented on Second to Last Syllable	821
G) Accented on Third to Last Syllable	825
H) Accented on Fourth to Last Syllable	829
<u>Medial Cadences on Di</u>	
I) Accented on Last Syllable	831
J) Accented on Second to Last Syllable	837
K) Accented on Third to Last Syllable	844
L) Accented on Fourth to Last Syllable	852
<u>Other Formulae</u>	
M) Medial Formulae Nee - Low Di	857
N) Medial Formulae Di - High Nee	860
O) Cadences on Pa	865
P) Fthoras	867
Q) Old (slow) Sticheraric Formulae	873
<u>Ending Formulae</u>	
R) Final Cadences	894
S) Final Cadences for Theotokia	899

* The Byzantine music formulae herein were extracted from sticheraric melodies found in the *Zoe Anastasimatarion* (14th edition, 2002) Volume I of *Mousike Kypsele* (1883 edition), and Volume I of the *Athonas* (1906 edition) by Petros Philanthidis.

Key:

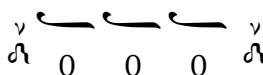
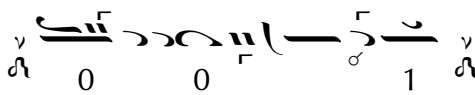
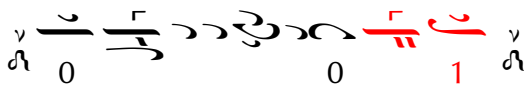

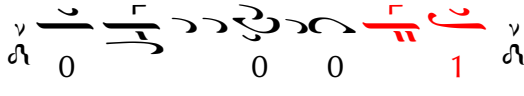

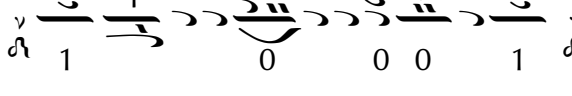

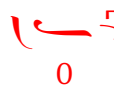
1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

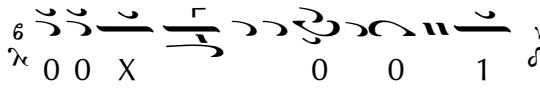
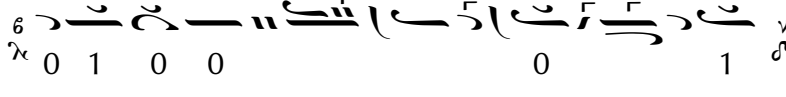



Medial Cadences on Nee

A) Accented on Last Syllable

Nee - Nee

000		
001		
		
0001		
10001		
		

Vou - Nee

00X001		
010001		
0X0X0X		
0100001		
10010001		

Di - Nee

Plagal Fourth Mode - Sticheric

00 $\overset{\Delta}{\underset{\text{A}}{\text{A}}} \text{ } \overset{\gamma}{\text{A}}$
 $\underset{0}{\text{0}} \quad \underset{0}{\text{0}}$

01 $\overset{\Delta}{\underset{\text{A}}{\text{A}}} \text{ } \overset{\gamma}{\text{A}}$
 $\underset{0}{\text{0}} \quad \underset{1}{\text{1}}$

10001 $\overset{\Delta}{\underset{\text{A}}{\text{A}}} \text{ } \overset{\gamma}{\text{A}}$
 $\underset{1}{\text{1}} \quad \underset{0}{\text{0}} \quad \underset{0}{\text{0}} \quad \underset{0}{\text{0}} \quad \underset{1}{\text{1}}$

100001 $\overset{\Delta}{\underset{\text{A}}{\text{A}}} \text{ } \overset{\gamma}{\text{A}}$
 $\underset{1}{\text{1}} \quad \underset{0}{\text{0}} \quad \underset{0}{\text{0}} \quad \underset{0}{\text{0}} \quad \underset{0}{\text{0}} \quad \underset{1}{\text{1}}$

B) Accented on Second to Last Syllable

Nee - Nee

10

$$\begin{array}{c} \gamma \quad \gamma \\ \mathcal{A} \quad 1 \quad 0 \quad \mathcal{A} \end{array}$$

$$\begin{array}{c} \gamma \quad \gamma \\ \mathcal{A} \quad 1 \quad 0 \quad \mathcal{A} \end{array}$$

$$\begin{array}{c} \gamma \quad \gamma \\ \mathcal{A} \quad 0 \quad 1 \quad 0 \quad \mathcal{A} \end{array}$$

010

0010 γ γ γ γ γ

0010010

γ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{0}$ γ

$\frac{1}{0}$ $\frac{1}{0}$

X010010

٧
ا

X

0

1

0

0

1

0

٧
ا

٧
ا

1

0

٧
ا

1

0

٧
ا

1

0

Plagal Fourth Mode - Sticheraric

00010010

0 0 0 1 0 0 1 0

1 0

1 0

00100010

0 0 1 0 0 0 1 0

0100X010

0 1 0 0 X 0 1 0

0010X010

0 0 1 0 X 0 1 0

01000010

0 1 0 0 0 0 1 0

0101000010

0 1 0 1 0 0 0 0 1 0

Vou - Nee

00010

0 0 0 1 0

1010010

1 0 1 0 0 1 0

X010010

X 0 1 0 0 1 0

0 0 1

0100010

0 1 0 0 0 1 0

Plagal Fourth Mode - Sticheraric

0 1

1000010

00100010

10010010

X0X0X010

100010010

101010010

Di - Nee

010

0010

10010

Plagal Fourth Mode - Sticheraric

$$\Delta_{\mathcal{S}} \begin{array}{cccccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 1 & 0 & 0 & \sigma & 0 & 1 & 0 \\ \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ \mathcal{S} & & & & & & & \mathcal{S} \end{array}$$

Δ
 δ
 γ
 δ

$$\begin{array}{ccccccccccc} \Delta & \sim & \sim & \sim & \sim & \sim & \sim & \sim & \sim & \sim & \sim \\ \hline \delta & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & \delta \end{array}$$
[illegible]

Δ
 \mathfrak{A}

1055

$$\frac{1}{2} \quad 0 \quad \frac{1}{2}$$
[illegible][illegible]
$$\frac{\Delta}{d_1} \rightarrow \begin{array}{cccccccccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 0 & 0 \end{array} \rightarrow \frac{\gamma}{d_2}$$

C) Accented on Third to Last Syllable

Nee - Nee

100 γ γ
1 0 0

$$^{\gamma} \mathfrak{A} \quad 1 \quad \text{“} \textcolor{red}{\mathfrak{A}} \text{“} \quad 0 \quad \text{“} \textcolor{red}{\mathfrak{A}} \text{“} \quad 0 \quad \text{“} \textcolor{red}{\mathfrak{A}} \text{“} \quad ^{\gamma} \mathfrak{A}$$

515

$$\begin{array}{ccccccc} \gamma & \gamma & \gamma & \gamma & \gamma & \gamma & \gamma \\ \alpha & 1 & 0 & 0 & 0 & 0 & \pi \\ & & & & & & q \end{array}$$

0100 $\begin{matrix} \gamma \\ \delta \end{matrix} \begin{matrix} \overline{1} & 1 & \overline{0} & \overline{1} & \overline{0} & \overline{1} \\ 0 & 1 & 0 & 1 & 0 & 1 \end{matrix} \begin{matrix} \gamma \\ \delta \end{matrix}$

$$\begin{array}{ccccccc} \gamma & & & & & & \gamma \\ \mathfrak{A} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \mathfrak{A} \\ & 0 & 1 & 0 & 0 & & \end{array}$$

You - Nee

00100

$\lambda_0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \quad \mu$

0

$$\begin{array}{ccccccc} \textcircled{\gamma_6} & \curvearrowright & \text{---} & \text{=} & \text{=}\overline{\text{=}}\text{=}\overline{\text{=}} & \text{=}\overline{\text{=}}\text{=}\overline{\text{=}} & \text{=}\overline{\text{=}}\text{=}\overline{\text{=}} \\ \gamma_k & 0 & 0 & 1 & & 0 & y_d \end{array}$$

10100 $\overset{6}{\lambda} \underset{1}{\curvearrowright} \underset{0}{\curvearrowright} \underset{1}{\curvearrowright} \text{---} \underset{1}{\curvearrowright} \text{---} \underset{0}{\curvearrowright} \text{---} \underset{0}{\curvearrowright} \text{---} \underset{0}{\curvearrowright} \underset{\lambda}{\curvearrowright}$

$$\begin{array}{ccccccc} \beta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \gamma \\ \gamma_k & 1 & 0 & 1 & & 0 & d \end{array}$$

010100

$$\begin{array}{ccccccccccc} \epsilon & & & & & & & & & & \gamma \\ \gamma & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \delta \\ & 0 & 1 & 0 & 1 & & & 0 & & & 0 \end{array}$$

Plagal Fourth Mode - Sticheraric

0X0100

6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

100100

6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

10010X

6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

0100100

6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1010100

6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

10X0100

6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

10X0100

6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Plagal Fourth Mode - Sticheraric

10100100 $\overset{6}{\lambda}$ 1 0 1 0 0 1 0 0 $\overset{\gamma}{\lambda}$

0

010X0100 $\overset{6}{\lambda}$ 0 1 0 X 0 1 0 0 $\overset{\gamma}{\lambda}$ 0

100100100 $\overset{6}{\lambda}$ 1 0 0 1 0 0 1 0 0 $\overset{\gamma}{\lambda}$

0

1010X0100 $\overset{6}{\lambda}$ 1 0 1 0 X 0 1 0 0 $\overset{\gamma}{\lambda}$ 0

Di - Nee

0100 $\overset{\Delta}{\lambda}$ 0 1 0 0 $\overset{\gamma}{\lambda}$

00100 $\overset{\Delta}{\lambda}$ 0 0 1 0 0 $\overset{\gamma}{\lambda}$

000100 $\overset{\Delta}{\lambda}$ 0 0 0 1 0 0 $\overset{\gamma}{\lambda}$

100100 $\overset{\Delta}{\lambda}$ 1 0 0 1 0 0 $\overset{\gamma}{\lambda}$

10010X $\overset{\Delta}{\lambda}$ 1 0 0 1 0 X $\overset{\gamma}{\lambda}$

1 0 1 0

1

Plagal Fourth Mode - Sticheraric

1

X0XX0X

Δ
A

X 0 X X 0 X

X X X

X0XXX0X

Δ
A

X 0 X X X 0 X

X X X

1000100

Δ
A

1 0 0 0 1 0 0

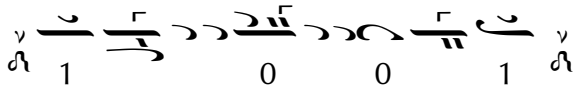
00100100

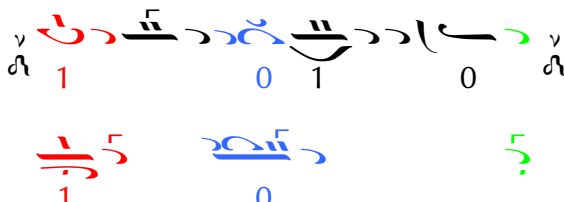
Δ
A

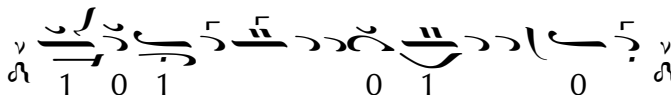
0 0 1 0 0 1 0 0

D) Accented on Fourth to Last Syllable

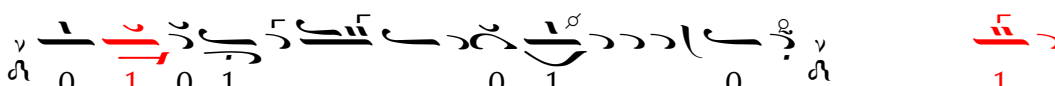
Nee - Nee

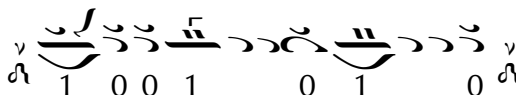
1001 

1010 

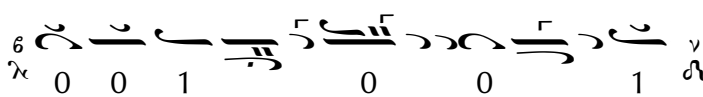
101010 

0101010 

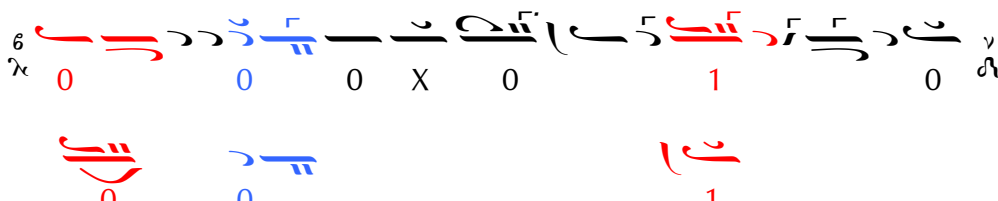


1001010 

Vou - Nee

001001 



000X010 

1001001 

Plagal Fourth Mode - Sticheric

1 0 0 1

0101010

100X010

00001001

0100X010

01001001

1000X010

010001001

01000X010

817

Plagal Fourth Mode - Sticheraric

Di - Nee

001001	$\overset{\Delta}{\underset{\cdot}{\text{A}}} \text{ 0 0 1 0 0 1 } \overset{\gamma}{\underset{\cdot}{\text{A}}}$	
0101001	$\overset{\Delta}{\underset{\cdot}{\text{A}}} \text{ 0 1 0 1 0 0 1 } \overset{\gamma}{\underset{\cdot}{\text{A}}}$	
1001001	$\overset{\Delta}{\underset{\cdot}{\text{A}}} \text{ 1 0 0 1 0 0 1 } \overset{\gamma}{\underset{\cdot}{\text{A}}}$	
0001010	$\overset{\Delta}{\underset{\cdot}{\text{A}}} \text{ 0 0 0 1 0 1 0 } \overset{\gamma}{\underset{\cdot}{\text{A}}}$	
0101010	$\overset{\Delta}{\underset{\cdot}{\text{A}}} \text{ 0 1 0 1 0 1 0 } \overset{\gamma}{\underset{\cdot}{\text{A}}}$	
00101010	$\overset{\Delta}{\underset{\cdot}{\text{A}}} \text{ 0 0 1 0 1 0 1 0 } \overset{\gamma}{\underset{\cdot}{\text{A}}}$	
01001010	$\overset{\Delta}{\underset{\cdot}{\text{A}}} \text{ 0 1 0 0 1 0 1 0 } \overset{\gamma}{\underset{\cdot}{\text{A}}}$	

Medial Cadences on Vou

E) Accented on Last Syllable

Nee - Vou

$$000 \quad \gamma \quad \text{---} \quad \text{---} \quad \text{---} \quad \delta$$

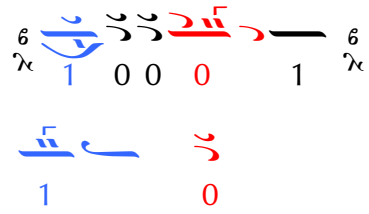
$$\quad \quad \quad 0 \quad \quad 0 \quad \quad 0 \quad \quad \kappa$$
$$01 \quad \begin{array}{c} \gamma \\ \mathfrak{A} \end{array} \quad \begin{array}{c} \overline{\gamma} \\ 0 \end{array} \quad \begin{array}{c} \gamma \\ 1 \end{array} \quad \begin{array}{c} \delta \\ \gamma \end{array} \quad \begin{array}{c} \overline{\gamma} \\ 0 \end{array} \quad \begin{array}{c} \gamma \\ 1 \end{array} \quad \begin{array}{c} \delta \\ \gamma \end{array}$$
$$\begin{array}{ccccccc} & & \gamma & & & & \epsilon \\ & & \curvearrowright & \text{---} & \text{---} & \text{---} & \\ 0001 & \delta & 0 & 0 & 0 & 1 & \lambda \end{array}$$

00001 γ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{0}$ $\frac{1}{1}$ $\frac{1}{\gamma}$

You - You

$$00 \quad \begin{array}{cc} \overset{6}{\lambda} & \overset{6}{\lambda} \\ \text{---} & \text{---} \\ 0 & 0 \end{array}$$
$$\begin{array}{ccc} \epsilon & \supset & \epsilon \\ \lambda & 0 & \lambda \\ & 0 & 0 \end{array}$$
$$01 \quad \begin{array}{c} \textcircled{6} \\ \lambda \end{array} \quad \begin{array}{c} \textcircled{5} \\ 0 \end{array} \quad \begin{array}{c} \textcircled{6} \\ 1 \end{array} \quad \begin{array}{c} \textcircled{6} \\ \lambda \end{array}$$
$$000 \quad \begin{array}{c} 6 \\ \lambda \end{array} \quad \begin{array}{c} 6 \\ \lambda \end{array} \quad \begin{array}{c} 6 \\ \lambda \end{array} \quad \begin{array}{c} 6 \\ \lambda \end{array}$$
$$001 \quad \begin{array}{c} \overset{6}{\lambda} \quad \overset{6}{\lambda} \\ \text{---} \quad \text{---} \quad \text{---} \\ 0 \quad 0 \quad 1 \end{array}$$
$$0000 \quad \begin{array}{c} \overset{6}{\lambda} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \overset{6}{\lambda} \\ \underset{0}{\lambda} \quad 0 \quad 0 \quad 0 \quad 0 \end{array}$$
$$10001 \quad {}^6\lambda \begin{array}{c} \overline{} \\ \underbrace{} \end{array} \begin{array}{ccccc} \curvearrowright & \curvearrowright & \curvearrowright & \text{---} & \curvearrowleft \end{array} \quad {}^6\lambda$$

Plagal Fourth Mode - Sticheraric



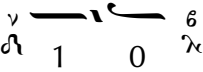
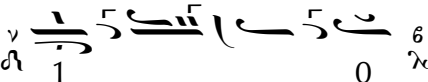
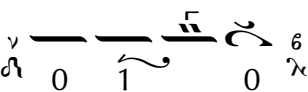
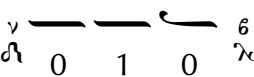
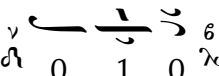
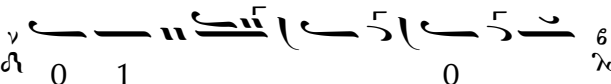
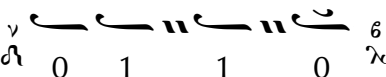
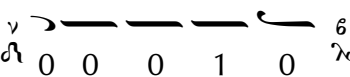
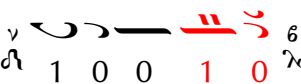
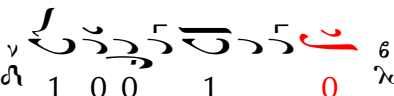
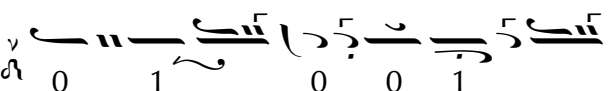
Di - Vou

000	<p>Δ λ</p> <p>0 0 0 6 λ</p>
0000	<p>Δ λ</p> <p>0 0 0 0 6 λ</p>
01	<p>Δ λ</p> <p>0 1 6 λ</p>
001	<p>Δ λ</p> <p>0 0 1 6 λ</p>
	<p>Δ λ</p> <p>0 0 1 6 λ</p>
0101	<p>Δ λ</p> <p>0 1 0 1 6 λ</p>
0001	<p>Δ λ</p> <p>0 0 0 1 6 λ</p>
10001	<p>Δ λ</p> <p>1 0 0 0 1 6 λ</p>
010001	<p>Δ λ</p> <p>0 1 0 0 0 1 6 λ</p>

Plagal Fourth Mode - Sticheraric

F) Accented on Second to Last Syllable

Nee - Vou

10	
010	
	
	
	
	
0110	
00010	
10010	
	
010010	

$$\begin{array}{cc} \overline{1} & \overline{0} \\ 1 & 0 \\ \overline{0} & \overline{5} & \overline{2} \\ 0 & & \end{array}$$

You - You

Plagal Fourth Mode - Sticheraric

[illegible]
$$\begin{array}{c} \begin{array}{c} \textcircled{\text{6}} \\ \lambda \end{array} \quad \begin{array}{c} \textcircled{\text{1}} \\ 1 \end{array} \quad \begin{array}{c} \textcircled{\text{0}} \\ 0 \end{array} \quad \begin{array}{c} \textcircled{\text{6}} \\ \lambda \end{array} \end{array}$$
$$\begin{array}{ccccc} 6 & \overline{} & \overline{} & \overline{} & 6 \\ \lambda & 1 & & 0 & \lambda \end{array}$$
$$\begin{array}{ccc} \begin{array}{c} 6 \\ \lambda \end{array} & \begin{array}{c} \text{---} \\ 1 \end{array} & \begin{array}{c} \text{---} \\ 0 \end{array} & \begin{array}{c} 6 \\ \lambda \end{array} \end{array}$$
$${}^6\lambda_0 \quad {}^6\lambda_1 \quad {}^6\lambda_0$$
$${}^6\lambda_0 \quad {}^5\lambda_1 \quad {}^6\lambda_0$$
[illegible]

55

[illegible]

۱۵

$$\begin{array}{ccccccc} \overset{6}{\lambda} & \curvearrowright & \frac{1}{\lambda} & \curvearrowright & \overset{\sigma}{0} & \curvearrowright & \overset{6}{\lambda} \\ & 0 & & & 1 & & 0 \end{array}$$
$$\begin{array}{ccccccc} \text{6} & \text{6} & & & & & \text{6} \\ \lambda & 0 & 0 & 1 & & 0 & \lambda \end{array}$$
$$\begin{array}{ccccccc} \begin{array}{c} \textcircled{6} \\ \gamma_1 \end{array} & \begin{array}{c} \textcircled{0} \\ 0 \end{array} & \begin{array}{c} \textcircled{0} \\ 0 \end{array} & \begin{array}{c} \textcircled{0} \\ 0 \end{array} & \begin{array}{c} \textcircled{1} \\ 1 \end{array} & \begin{array}{c} \textcircled{0} \\ 0 \end{array} & \begin{array}{c} \textcircled{6} \\ \gamma_1 \end{array} \end{array}$$
$$\begin{array}{ccccccc} \epsilon & & & & & & \epsilon \\ \chi & & & & & & \chi \\ & \curvearrowright & \text{---} & \text{---} & \text{---} & \text{---} & \\ & 0 & \chi & 0 & 1 & 0 & \end{array}$$
$${}^6_{\lambda} \begin{array}{ccccccc} \text{♭} & \text{♮} & \text{♮} & \text{♮} & \text{♮} & \text{♮} & \text{♮} \\ 1 & 0 & 0 & & 1 & & 0 \end{array} {}^6_{\lambda}$$
$$\begin{array}{ccccccc} \begin{array}{c} \textcircled{6} \\ \gamma_k \end{array} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \begin{array}{c} \textcircled{6} \\ \gamma_k \end{array} \\ & 0 & 1 & 0 & 0 & 1 & 0 \end{array}$$
$${}^6\gamma_1 \quad {}^6\gamma_0 \quad {}^6\gamma_0 \quad {}^6\gamma_0 \quad {}^6\gamma_1 \quad {}^6\gamma_0 \quad {}^6\gamma_0$$
$$\begin{array}{ccccccccccc} \overset{6}{\gamma} & \text{⌞} & \text{⌞} & \text{⌞} & \text{⌞} & \text{⌞} & \text{⌞} & \text{⌞} & \text{⌞} & \text{⌞} & \overset{6}{\gamma} \\ & 1 & 0 & 0 & & 0 & & 1 & & 0 & \end{array}$$

Plagal Fourth Mode - Sticheraric

6
λ 1 0 0 0 1 0 λ

Di - Vou

10 Δ 1 0 λ

010 Δ 0 1 0 λ

0

Δ 0 1 0 λ

Δ 0 1 0 λ

0010 Δ 0 0 1 0 λ

0

Δ 0 0 1 0 λ

0

Δ 0 0 1 0 λ

Δ 0 0 1 0 λ

00010 Δ 0 0 0 1 0 λ

Δ 0 0 0 1 0 λ

10010 Δ 1 0 0 1 0 λ

1

Δ 1 0 0 1 0 λ

Plagal Fourth Mode - Sticheraric

X010010 $\overset{\Delta}{\mathcal{A}}_X$ 0 1 0 0 1 0 $\overset{6}{\lambda}$

10010010 $\overset{\Delta}{\mathcal{A}} \underbrace{\quad}_{1} \rightsquigarrow \rightsquigarrow \underbrace{\quad}_{001} \rightsquigarrow \rightsquigarrow \underbrace{\quad}_{00} \text{---} \underbrace{\quad}_{1} \rightsquigarrow \rightsquigarrow \rightsquigarrow \overset{6}{\lambda}$

G) Accented on Third to Last Syllable

Nee - Vou

0100			
		0101	
00100			
10100			
0X0100			
100100			
0100100			

You - You

$$\begin{array}{c}
100 \\
\begin{array}{ccccc}
\overset{6}{\lambda} & \begin{array}{c} \text{---} \text{---} \text{---} \\ \text{---} \text{---} \end{array} & \text{---} & \text{---} & \overset{6}{\lambda} \\
& 1 & 0 & 0 & \\
\end{array} \\
\\
\begin{array}{ccccc}
\overset{6}{\lambda} & \begin{array}{c} \text{---} \text{---} \text{---} \\ \text{---} \text{---} \end{array} & \text{---} & \text{---} & \overset{6}{\lambda} \\
& 1 & 0 & 0 & \\
\end{array} \\
\\
\begin{array}{ccccc}
\overset{6}{\lambda} & \begin{array}{c} \text{---} \text{---} \text{---} \\ \text{---} \text{---} \end{array} & \text{---} & \text{---} & \overset{6}{\lambda} \\
& 1 & 0 & 0 & \\
\end{array} \\
\\
0100 \\
\begin{array}{ccccc}
\overset{6}{\lambda} & \text{---} & \begin{array}{c} \text{---} \text{---} \text{---} \\ \text{---} \text{---} \end{array} & \text{---} & \overset{6}{\lambda} \\
& 0 & 1 & 0 & 0 \\
\end{array}
\end{array}$$

Plagal Fourth Mode - Sticheraric

$$\begin{array}{ccccccc} 6 & \text{—} & \overline{\text{—}} & \text{—} & \text{—} & 6 \\ \lambda & 0 & 1 & 0 & 0 & \lambda \end{array}$$
$$\begin{array}{ccccccc} \epsilon & & & \rho & & & \epsilon \\ \lambda & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \lambda \\ & 0 & 1 & & 0 & 0 & \end{array}$$

00100

$$\begin{array}{ccccccc} \overset{6}{\lambda} & \overset{5}{\curvearrowright} & \backslash & \overset{5}{\curvearrowright} & - & \overset{5}{\curvearrowright} & \overset{6}{\lambda} \\ & 0 & & 0 & & 1 & 0 & 0 \end{array}$$

0X100

$$\begin{array}{ccccccc} \epsilon & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \epsilon \\ \chi & 0 & X & 1 & 0 & 0 & \chi \end{array}$$

100100

$$\begin{array}{ccccccc} \epsilon & & & & & & \epsilon \\ \nearrow & \searrow & \searrow & \searrow & \searrow & \searrow & \nearrow \\ \lambda & 1 & 0 & 0 & 1 & 0 & \lambda \end{array}$$
$$\begin{array}{ccccccc} \overset{6}{\underset{\lambda}{\curvearrowright}} & \curvearrowright & \curvearrowright & \overset{11}{\underset{\curvearrowright}{\rule{0.5cm}{0.4pt}}} & \curvearrowright & \curvearrowright & \overset{6}{\underset{\lambda}{\curvearrowright}} \\ 1 & 0 & 0 & 1 & 0 & 0 \end{array}$$

Di - Vou

100

$$\begin{array}{ccccccc} \Delta & \smile & \smile & \smile & 6 & & \\ \mathfrak{A} & \smile & \smile & \smile & \lambda & & \\ 1 & 0 & 0 & & & & \end{array}$$

Δ

1 0 0

λ^6

$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \epsilon \\ \mathfrak{A} & 1 & 0 & 0 & & & \lambda \end{array}$$

0100

$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & 6 \\ \delta & 0 & 1 & 0 & 0 & & \lambda \end{array}$$
$$\begin{array}{ccccccc} \Delta & 1 & 5 & - & 1 & 0 & 0 \\ \mathfrak{A} & 0 & & & 1 & 0 & 0 \\ & & & & & & \mathfrak{A} \end{array}$$

1 0 0

1 0 5 0

Plagal Fourth Mode - Sticheric

1 0 0

1 0 0

X0100

X 0 1 0 0

X 0 1 0 0

1 0 0

1 0 0

1 0 0

1 0 0

?

100100

1 0 0 1 0 0

0

1 0 0 1 0 0

0

1 0 0 1 0 0

0

0010100

0 0 1 0 1 0 0

Plagal Fourth Mode - Sticheric

0100100

$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}}$
 $\overset{\Delta}{\underset{\delta}{\mathfrak{A}}}$
0 1 0 0 1 0 0 $\overset{6}{\lambda}$

1000100

$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}}$
 $\overset{\Delta}{\underset{\delta}{\mathfrak{A}}}$
1 0 0 0 1 0 0 $\overset{6}{\lambda}$

0

$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}}$
 $\overset{\Delta}{\underset{\delta}{\mathfrak{A}}}$
1 0 0 0 1 0 0 $\overset{6}{\lambda}$

0

$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}}$
 $\overset{\Delta}{\underset{\delta}{\mathfrak{A}}}$
1 0 0 0 1 0 0 $\overset{6}{\lambda}$

0

1010100

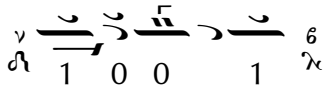
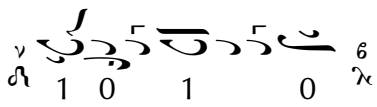
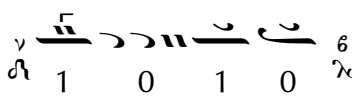
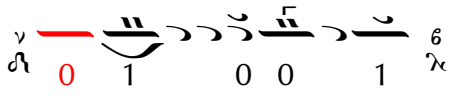
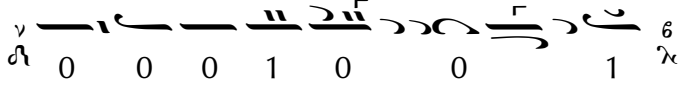
$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}}$
 $\overset{\Delta}{\underset{\delta}{\mathfrak{A}}}$
1 0 1 0 1 0 0 $\overset{6}{\lambda}$

00100100

$\overset{\Delta}{\underset{\delta}{\mathfrak{A}}}$
 $\overset{\Delta}{\underset{\delta}{\mathfrak{A}}}$
0 0 1 0 0 1 0 0 $\overset{6}{\lambda}$

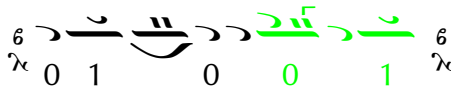

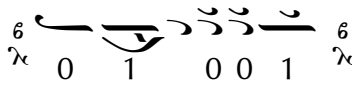
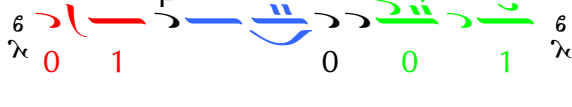

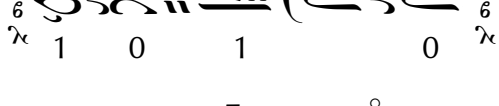
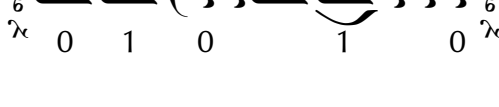
H) Accented on Fourth to Last Syllable

Nee - Vou

1001	
1010	
	
01001	
0001001	



Vou - Vou

01001		
		
		
		
1010		
01010		

Di - Vou

Plagal Fourth Mode - Sticheraric

1000 $\Delta_{\tilde{\chi}}^{\tilde{\chi}} \begin{matrix} \tilde{\chi} & \tilde{\chi} & \tilde{\chi} & \tilde{\chi} & \tilde{\chi} \\ 1 & 0 & 0 & 0 & 6 \end{matrix} \chi$

01010

$\frac{\Delta}{\alpha}$
 $\frac{1}{0}$
 $\frac{1}{1}$
 $\frac{1}{0}$
 $\frac{1}{1}$
 $\frac{1}{0}$
 $\frac{6}{\gamma}$


001001

Δ

$\frac{6}{\lambda}$

0 0 1 0 0 1

0001001

Δ
 δ

 0 0 0 1 0 0 1

6
 λ

00101010

0 0 1 0 1 0 1 0 0 1 0

6

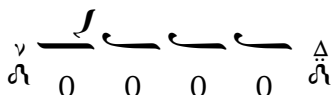
λ

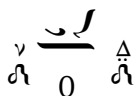
0 0

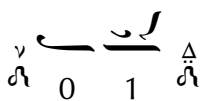
Medial Cadences on Di

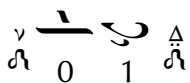
I) Accented on Last Syllable

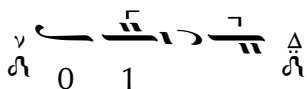
Nee - Di

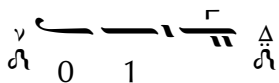
0000 

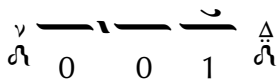
0 

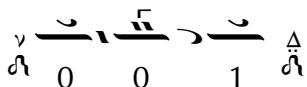
01 

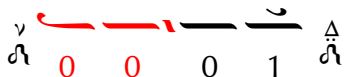


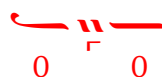





001 

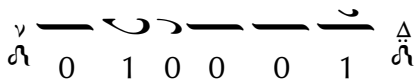


0001 



00101 

10001 

010001 

Plagal Fourth Mode - Sticheraric

010001

$\overset{\vee}{\text{A}} \text{ — } \overset{\text{f}}{\text{0}} \text{ — } \overset{\text{f}}{\text{1}} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \overset{\Delta}{\text{A}}$

$\overset{\vee}{\text{A}} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \overset{\Delta}{\text{A}}$

100001

$\overset{\vee}{\text{A}} \text{ — } \text{1} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \overset{\Delta}{\text{A}}$

$\overset{\vee}{\text{A}} \text{ — } \text{1} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \overset{\Delta}{\text{A}}$

0010001

$\overset{\vee}{\text{A}} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \overset{\Delta}{\text{A}}$

$\text{1} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \overset{\Delta}{\text{A}}$

$\overset{\vee}{\text{A}} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \overset{\Delta}{\text{A}}$

Vou - Di

000

$\overset{6}{\gamma} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \overset{\Delta}{\text{A}}$

01

$\overset{6}{\gamma} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \overset{\Delta}{\text{A}}$

001

$\overset{6}{\gamma} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \overset{\Delta}{\text{A}}$

0001

$\overset{6}{\gamma} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \overset{\Delta}{\text{A}}$

10001

$\overset{6}{\gamma} \text{ — } \text{1} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \overset{\Delta}{\text{A}}$

$\text{1} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \overset{\Delta}{\text{A}}$

$\overset{6}{\gamma} \text{ — } \text{1} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \overset{\Delta}{\text{A}}$

$\overset{6}{\gamma} \text{ — } \text{1} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{0} \text{ — } \text{1} \text{ — } \overset{\Delta}{\text{A}}$

Plagal Fourth Mode - Sticheraric

$$\begin{array}{ccccccc} \epsilon & \hookrightarrow & \hookrightarrow & \hookrightarrow & \overline{\epsilon} & \hookrightarrow & \Delta \\ \chi & 1 & 0 & 0 & 0 & 1 & \mathfrak{A} \end{array}$$
$${}^6_{\lambda} \begin{array}{ccccccc} \psi & \psi & \bar{\psi} & - & \psi & \psi & - \\ 1 & 0 & 0 & 0 & 1 & & \Delta \end{array}$$
$${}^6\chi_1 \quad \overline{\text{---}} \quad \overline{\text{---}} \quad \text{---} \quad \text{---} \quad \Delta$$

010001

100001

$${}^6_7 \begin{array}{ccccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 1 & 0 & 0 & 0 & 0 & 1 & \end{array} \begin{array}{c} \Delta \\ \text{---} \end{array}$$

10X0001

$$\underline{D_i - D_i}$$

00000

01

$$\begin{array}{ccc} \Delta & \text{---} & \Delta \\ \text{---} & & \text{---} \\ 0 & 1 & \end{array}$$
$$\overset{\Delta}{\underset{\cdot\cdot}{\mathfrak{A}}} \quad \overset{\curvearrowright}{\rule{1.5cm}{0.4pt}} \quad \overset{\curvearrowright}{\rule{1.5cm}{0.4pt}} \quad \overset{\Delta}{\underset{\cdot\cdot}{\mathfrak{A}}}$$

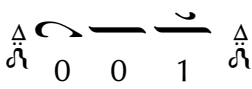
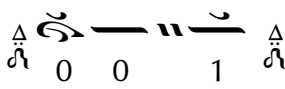
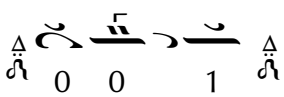
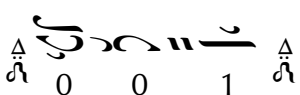
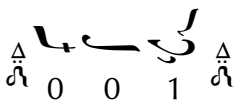
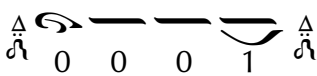
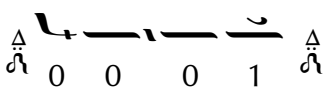
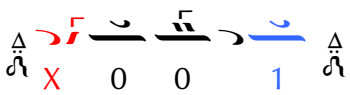


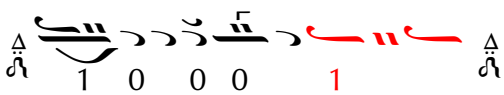

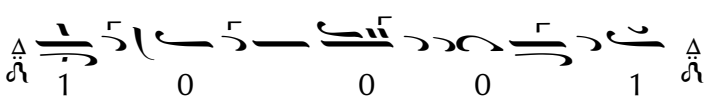
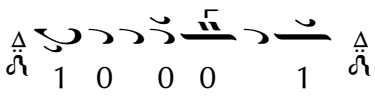
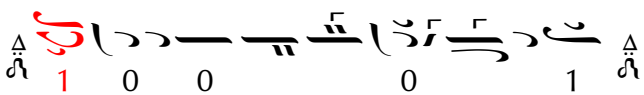

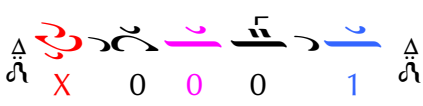

0 1

$$\begin{array}{c} \Delta \\ \text{0} \end{array} \quad \begin{array}{c} \Delta \\ \text{1} \end{array} \quad \begin{array}{c} \Delta \\ \text{0} \end{array}$$

1

1

Plagal Fourth Mode - Sticheric

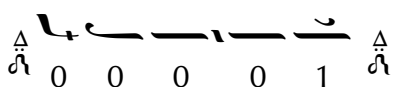
001		
		
		
		
0001		
		
X001		
		
		
10001		
		
		
		
X0001		

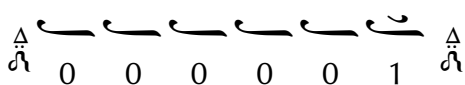
Plagal Fourth Mode - Sticheric

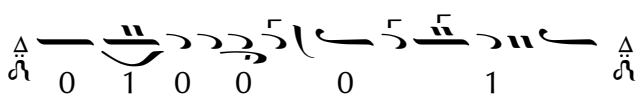

X

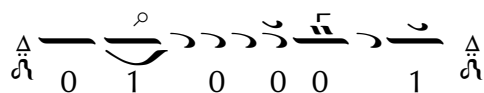

1

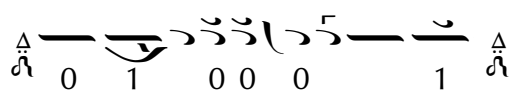

X

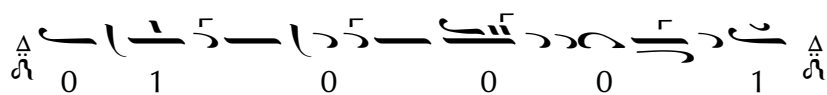
00001 

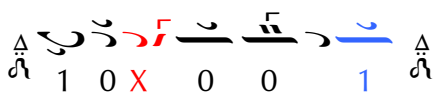
000001 

010001 







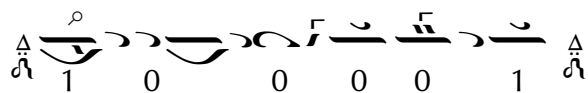
10X001 

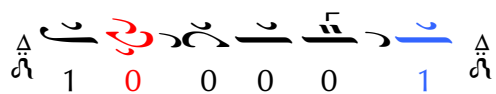

X


1













X

100001 





Plagal Fourth Mode - Sticheraric

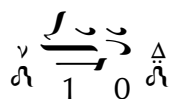
			
	0	1	
			
	X		
10X0001			
	1	0	X
			0
			0
			1
			
			0
			
	1	0	X
			1
			
		X	

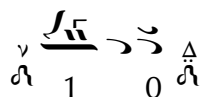
J) Accented on Second to Last Syllable

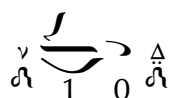
Nee - Di

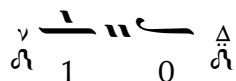
10

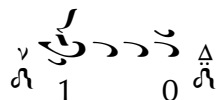





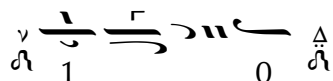




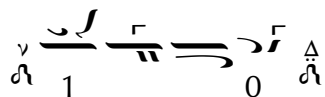


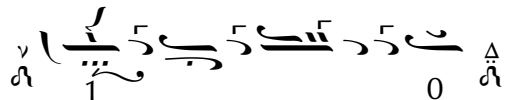


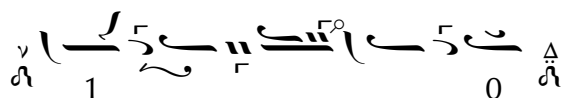












Note:

All these 10 formulae may be used as a 010 formula by inserting an izon before the first character)



Plagal Fourth Mode - Sticheraric

010

$$\begin{array}{ccccccc} \gamma & & & & & & \Delta \\ \mathfrak{A} & \text{---} & \frac{J_{\mathfrak{A}}}{1} & \text{---} & \mathfrak{A} & & \mathfrak{A} \\ & 0 & & 0 & & & \end{array}$$
$$\mathfrak{A} \xrightarrow{0} \mathfrak{A} \xrightarrow{1} \mathfrak{A} \xrightarrow{0} \mathfrak{A}$$
[illegible]
$$\begin{array}{ccccccc} \gamma & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \mathfrak{A} & 0 & 1 & \pi & & 0 & \mathfrak{A} \end{array}$$
$$\gamma \frac{\gamma}{0} \frac{1}{1} \frac{0}{0} \Delta$$
$$\begin{array}{cc} \frac{5}{1} & 2 \\ 1 & 0 \end{array}$$

0010

1 0

Diagram illustrating a quantum circuit with 4 qubits. The qubits are labeled 0, 1, 2, and 3. The initial state is γ on qubit 0 and Δ on qubit 3. The circuit consists of two layers of gates. The first layer has a CNOT gate from qubit 0 to qubit 1, followed by a CNOT gate from qubit 2 to qubit 3. The second layer has a CNOT gate from qubit 1 to qubit 0, followed by a CNOT gate from qubit 3 to qubit 2. The final state is shown as a tensor product of the states of the four qubits: γ , 0, 1, and Δ .

1 0

X010

100010

$$\begin{array}{ccccccccccc} \gamma & \overline{\cup} & \cup & \text{---} & \text{---} & \cup & \text{---} & \cup & \text{---} & \cup & \Delta \\ \delta & 1 & 0 & 0 & 0 & 1 & & & & 0 & \delta \end{array}$$
$$\begin{array}{ccccccccccc} \gamma & & & & & & & & & & \Delta \\ \mathfrak{A} & \frac{1}{1} & \hookleftarrow & \frac{1}{0} & \rightarrow & \frac{1}{0} & \rightarrow & \frac{1}{0} & \rightarrow & \frac{1}{0} & \rightarrow & \mathfrak{A} \end{array}$$
$$\begin{array}{ccccccc} \gamma & \overline{1} & 0 & 0 & 0 & 1 & 0 & \Delta \\ \alpha & 1 & 0 & 0 & 0 & 1 & 0 & \alpha \end{array}$$

$\frac{u}{1}$	$\frac{v}{0}$
---------------	---------------

$$\gamma_{\partial} \frac{1}{1} \sim \frac{1}{0} \frac{1}{0} \frac{1}{0} \frac{1}{1} \sim \frac{1}{0} \gamma_{\partial}$$
$$\mathcal{Z}_0$$

0.2

Vou - Di

Plagal Fourth Mode - Sticheraric

10

$$\begin{array}{c} \epsilon \\ \lambda \end{array} \quad \begin{array}{cc} \text{---} & \text{---} \\ 1 & 0 \end{array} \quad \begin{array}{c} \Delta \\ \vdots \\ \text{---} \end{array}$$
$$\begin{array}{c} \text{6} \\ \lambda \end{array} \begin{array}{c} \text{---} \\ \text{1} \end{array} \begin{array}{c} \text{---} \\ \text{0} \end{array} \begin{array}{c} \Delta \\ \text{---} \\ \text{---} \end{array}$$
$$\begin{array}{cccc} \epsilon & \hookrightarrow & \hookrightarrow & \Delta \\ \lambda & 1 & 0 & \ddot{\alpha} \end{array}$$
$$\chi^6_1 \sim \chi^5_0 \Delta \chi$$

010

$$\begin{array}{ccccccc} \epsilon & \text{---} & \text{=} & \text{=} & \text{=} & \Delta & \\ \lambda & 0 & 1 & 0 & & \text{---} & \end{array}$$
$$\begin{array}{c} 6 \\ \gamma \\ 0 \end{array} \text{---} \begin{array}{c} \sqrt{1} \\ 1 \end{array} \text{---} \begin{array}{c} \sqrt{1} \\ 0 \end{array} \text{---} \begin{array}{c} \Delta \\ \gamma \\ 0 \end{array}$$
$$\begin{array}{ccccccc} 6 & & 2 & & 1 & & 1 \\ \gamma & \xrightarrow{\quad} & & \xrightarrow{\quad} & \xrightarrow{\quad} & \xrightarrow{\quad} & \Delta \\ 0 & & 1 & & & & 0 \end{array}$$
 $\frac{6}{\lambda} \text{---}_0 \cup_1 \text{---}_{\Delta/\delta}$

0

$$\frac{1}{0}$$
$$\begin{array}{ccccccc} 6 & & & \Gamma & & & \Delta \\ \lambda & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ & 0 & 1 & & & 0 & \mathfrak{A} \end{array}$$

0010

$$\begin{array}{ccccccc} \epsilon & & & & \sqrt{} & & \Delta \\ \gamma & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ & 0 & 0 & 1 & 0 & & \end{array}$$
$$\begin{array}{ccccccc} \epsilon & \text{---} & \frac{\Gamma}{\Pi} & \text{---} & \frac{\Gamma}{\Pi} & (\text{---}) & \frac{\Gamma}{\Pi} \\ \lambda_0 & & 0 & & 0 & & 1 \\ & & & & & & 0 \\ & & & & & & \Delta_{\tilde{A}} \end{array}$$
$$\begin{array}{ccccccc} \overset{6}{\curvearrowright} & \text{---} & \text{---} & \overset{\curvearrowright}{\text{---}} & \text{---} & \overset{\Gamma}{\text{---}} & \overset{\curvearrowright}{\text{---}} \\ \chi_0 & 0 & 0 & 1 & \Gamma & & 0 \end{array} \quad \overset{\Delta}{\underset{\ddot{\mathfrak{A}}}{\text{---}}}$$
$$\begin{array}{ccccccc} \epsilon & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \lambda & 0 & 0 & 1 & 0 & 0 & \end{array}$$

Plagal Fourth Mode - Sticheraric

00010

$$\begin{array}{ccccccc} \epsilon & \curvearrowright & \text{---} & \text{---} & \text{=} & \curvearrowleft & \Delta \\ \chi & 0 & 0 & 0 & 1 & 0 & \mathfrak{A} \end{array}$$
$$\begin{array}{ccccccccc} \epsilon & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \lambda & 0 & 0 & 0 & 1 & 0 & & & \mathfrak{A} \end{array}$$
$$\begin{array}{ccccccccccc} \epsilon & \rightarrow & \rightarrow & \rightarrow & \rightarrow & \rightarrow & \rightarrow & \rightarrow & \rightarrow & \rightarrow & \rightarrow \\ \lambda & 0 & 0 & 0 & 1 & & & & & 0 & \Delta \\ & & & & & & & & & & \delta \end{array}$$

10010

$$\begin{array}{ccccccc} \overset{\delta}{\underset{\lambda}{\hookrightarrow}} & \text{---} & \overset{\Gamma}{\text{---}} & \text{---} & \overset{\gamma}{\text{---}} & \text{---} & \overset{\gamma}{\text{---}} \\ & & \sim & & 0 & 0 & 1 \\ & & & & & & \end{array}$$

010010

$$\begin{array}{ccccccccccc} \epsilon & & & & & & & & & & \Delta \\ \gamma & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \delta \\ 0 & 1 & & 0 & 0 & & 1 & & 0 & & \end{array}$$

100010

$$\begin{array}{ccccccc} \overset{6}{\lambda} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ & 1 & \sim & 0 & 0 & 0 & 1 \\ & & & & & & 0 \end{array}$$

0100010

$$\begin{array}{cccccccc} \frac{6}{\gamma_k} & \text{---} & \text{=} & \text{=} & \text{=} & \text{=} & \text{=} & \frac{\Delta}{\delta_k} \\ & 0 & 1 & 0 & 0 & 0 & 1 & 0 \end{array}$$
$$\underline{D_i - D_i}$$

10

Δ $\overset{\circ}{\curvearrowright}$ $\overset{\circ}{\curvearrowright}$ Δ
 1 0

$$\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}_1 \text{---} \overset{\Gamma}{\underset{\sim}{\mathfrak{A}}} \text{---} \overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}_0$$
$$\overset{\Delta}{\underset{0}{\text{آ}}} \sim \overset{\Delta}{\underset{1}{\text{آ}}} \sim \overset{\Delta}{\underset{0}{\text{آ}}}$$
[illegible]

0.2

0

Plagal Fourth Mode - Sticheraric

010

[illegible]

Plagal Fourth Mode - Sticheric

0010

Δ Δ 0 0 1 0 Δ

Δ Δ 0 0 1 0 Δ

Δ Δ 0 0 1 0 Δ

Δ Δ 0 0 1 0 Δ

Δ Δ 0 0 1 0 Δ

Δ Δ 0 0 1 0 Δ

X010

Δ Δ 0 0 1 0 Δ

00010

Δ Δ 0 0 0 1 0 Δ

Δ Δ 0 0 0 1 0 Δ

Δ Δ 0 0 0 1 0 Δ

10010

Δ Δ 1 0 0 1 0 Δ

Δ Δ 1 0 0 1 0 Δ

Δ Δ 1 0 0 1 0 Δ

Δ Δ 1 0 0 1 0 Δ

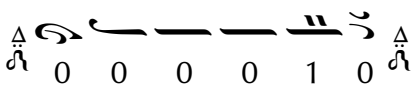
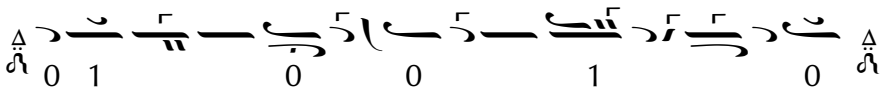
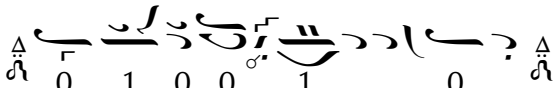
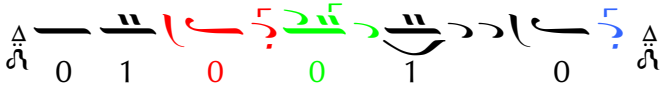

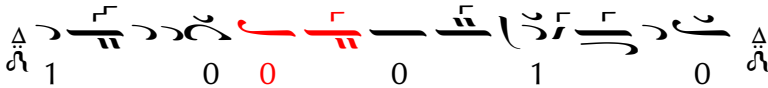

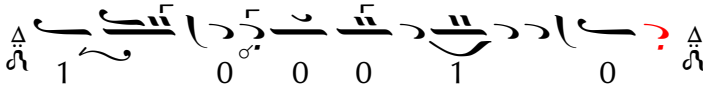

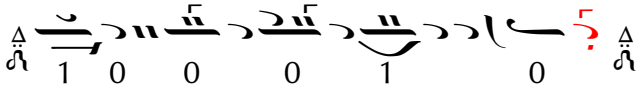

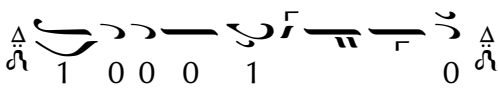

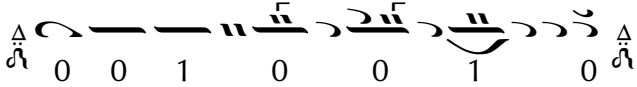
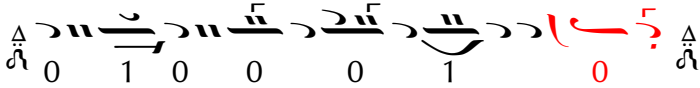

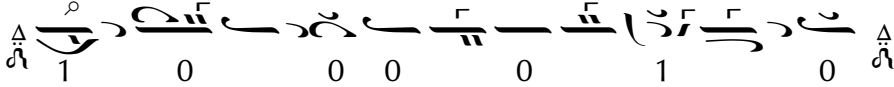
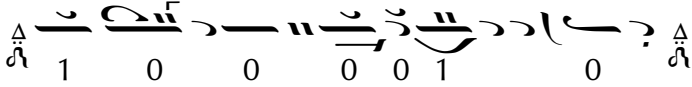
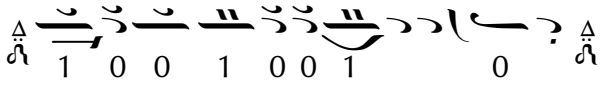
1

1

0

1

Plagal Fourth Mode - Sticheric

000010		
010010		
		
		
		
100010		
		
		
		
10X010		
0010010		
0100010		
1000010		
		
10010010		

K) Accented on Third to Last Syllable

Nee - Di

100	
101	
10X	
0100	
0101	

Plagal Fourth Mode - Sticheraric

The diagram illustrates the construction of a 10-bit Gray code sequence from a 10-bit binary sequence. The binary sequence is 0010010100, and the Gray code sequence is 0010010100. The diagram shows the bit-by-bit construction of the Gray code from the binary sequence, with the final Gray code sequence being 0010010100.

Binary sequence: 0010010100

Gray code sequence: 0010010100

The diagram shows the bit-by-bit construction of the Gray code from the binary sequence, with the final Gray code sequence being 0010010100.

Plagal Fourth Mode - Sticheric

Vou - Di

100	$\begin{array}{c} \overset{6}{\gamma} \text{ } \text{ } \text{ } \text{ } \overset{\Delta}{\delta} \\ 1 \quad 0 \quad 0 \end{array}$
	$\begin{array}{c} \overset{6}{\gamma} \text{ } \text{ } \text{ } \text{ } \overset{\Delta}{\delta} \\ 1 \quad 0 \quad 0 \end{array}$
	$\begin{array}{c} \overset{6}{\gamma} \text{ } \text{ } \text{ } \text{ } \overset{\Delta}{\delta} \\ 1 \quad 0 \quad 0 \end{array}$
	$\begin{array}{c} \overset{6}{\gamma} \text{ } \text{ } \text{ } \text{ } \overset{\Delta}{\delta} \\ 1 \quad 0 \quad 0 \end{array}$
0100	$\begin{array}{c} \overset{6}{\gamma} \text{ } \text{ } \text{ } \text{ } \overset{\Delta}{\delta} \\ 0 \quad 1 \quad 0 \quad 0 \end{array}$
	$\begin{array}{c} \overset{6}{\gamma} \text{ } \text{ } \text{ } \text{ } \overset{\Delta}{\delta} \\ 0 \quad 1 \quad 0 \quad 0 \end{array}$
010100	$\begin{array}{c} \overset{6}{\gamma} \text{ } \text{ } \text{ } \text{ } \overset{\Delta}{\delta} \\ 0 \quad 1 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$
0100100	$\begin{array}{c} \overset{6}{\gamma} \text{ } \text{ } \text{ } \text{ } \overset{\Delta}{\delta} \\ 0 \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$
	$\begin{array}{c} \overset{6}{\gamma} \text{ } \text{ } \text{ } \text{ } \overset{\Delta}{\delta} \\ 0 \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$
	$\begin{array}{c} \overset{6}{\gamma} \text{ } \text{ } \text{ } \text{ } \overset{\Delta}{\delta} \\ 0 \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$
1010100	$\begin{array}{c} \overset{6}{\gamma} \text{ } \text{ } \text{ } \text{ } \overset{\Delta}{\delta} \\ 1 \quad 0 \quad 1 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$
01000100	$\begin{array}{c} \overset{6}{\gamma} \text{ } \text{ } \text{ } \text{ } \overset{\Delta}{\delta} \\ 0 \quad 1 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$
	$\begin{array}{c} \overset{6}{\gamma} \text{ } \text{ } \text{ } \text{ } \overset{\Delta}{\delta} \\ 0 \quad 1 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$

Plagal Fourth Mode - Sticheraric

Di - Di

100

Δ Δ
Δ Δ 1 0 0 Δ Δ

1 0

Δ Δ
Δ Δ 1 0 0 Δ Δ

Δ Δ
Δ Δ 1 0 0 Δ Δ

Δ Δ
Δ Δ 1 0 0 Δ Δ

Δ Δ
Δ Δ 1 0 0 Δ Δ

Δ Δ
Δ Δ 1 0 0 Δ Δ

Δ Δ
Δ Δ 1 0 0 Δ Δ

0

Δ Δ
Δ Δ 1 0 0 Δ Δ

Δ Δ
Δ Δ 1 0 0 Δ Δ

Δ Δ
Δ Δ 1 0 0 Δ Δ

Δ Δ
Δ Δ 1 0 0 Δ Δ

1

Δ Δ
Δ Δ 1 0 0 Δ Δ

Δ Δ
Δ Δ 1 0 0 Δ Δ

Δ Δ
Δ Δ 1 0 0 Δ Δ

Plagal Fourth Mode - Sticheric

10X

Δ — " 5 5 5 5 Δ
1 0 X Δ

5 5

0100

Δ — — — — Δ
0 1 0 0 Δ

Δ — — — — Δ
0 1 0 0 Δ

Δ — — — — Δ
0 1 0 0 Δ

Δ — — — — Δ
0 1 0 0 Δ

— —
0 1

5

Δ — — — — Δ
0 1 0 0 Δ

Δ — — — — Δ
0 1 0 0 Δ

Δ — — — — Δ
0 1 0 0 Δ

Δ — — — — Δ
0 1 0 0 Δ

Δ — — — — Δ
0 1 0 0 Δ

Δ — — — — Δ
0 1 0 0 Δ

Δ — — — — Δ
0 1 0 0 Δ

Δ — — — — Δ
0 1 0 0 Δ

Plagal Fourth Mode - Sticheraric

1

0

0





0

0

0

0
$$\begin{array}{ccccccccc} \Delta & & & & & & & & \Delta \\ \text{A} & \text{B} & \text{C} & \text{D} & \text{E} & \text{F} & \text{G} & \text{H} & \text{I} \\ 0 & 0 & 1 & 0 & 0 & & & & \end{array}$$
$$\overset{\Delta}{\mathfrak{A}} \text{---} \underset{0}{\text{---}} \underset{0}{\text{---}} \underset{1}{\text{---}} \text{---} \text{---} \underset{0}{\text{---}} \text{---} \underset{0}{\text{---}} \overset{\Delta}{\mathfrak{A}}$$

Plagal Fourth Mode - Sticheraric

X0100

$\overset{\Delta}{\mathfrak{d}} \frac{\curvearrowright}{X} \frac{\curvearrowright}{0} \curvearrowright \frac{\curvearrowright}{1} \frac{\curvearrowright}{\sim} \frac{\curvearrowright}{0} \frac{\curvearrowright}{\curvearrowright} \frac{\curvearrowright}{\curvearrowright} \frac{\curvearrowright}{0} \overset{\Delta}{\mathfrak{d}}$
 $\frac{\curvearrowright}{0} \frac{\curvearrowright}{\curvearrowright}$

$\overset{\Delta}{\mathfrak{d}} \frac{\curvearrowright}{X} \frac{\curvearrowright}{0} \curvearrowright \frac{\curvearrowright}{1} \frac{\curvearrowright}{\curvearrowright} \frac{\curvearrowright}{\curvearrowright} \frac{\curvearrowright}{0} \frac{\curvearrowright}{\curvearrowright} \frac{\curvearrowright}{\curvearrowright} \frac{\curvearrowright}{0} \overset{\Delta}{\mathfrak{d}}$
 $\frac{\curvearrowright}{0} \frac{\curvearrowright}{\curvearrowright} \frac{\curvearrowright}{\curvearrowright}$

00101

$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 0 & & 1 & & 0 & 1 \end{array}$$

10100

$$\overset{\Delta}{\underset{\delta}{\mathcal{A}}} \underbrace{\quad}_1 \rightsquigarrow \underbrace{\quad}_0 \underbrace{\quad}_1 \rightsquigarrow \underbrace{\quad}_0 \underbrace{\quad}_0 \overset{\Delta}{\underset{\delta}{\mathcal{B}}}$$

$\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$
 $\underbrace{\quad\quad\quad}_1$
 $\underbrace{\quad\quad\quad}_0$
 $\underbrace{\quad\quad\quad}_1$
 $\underbrace{\quad\quad\quad}_0$
 $\underbrace{\quad\quad\quad}_0$
 $\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$

[illegible]

Δ
 Δ

1

$$\begin{array}{cc} \overline{1} & 0 \\ 1 & 0 \end{array}$$

000100

Δ
 Δ

010100

$$\overset{\Delta}{\mathfrak{A}} \text{---} \underset{0}{\text{---}} \underset{1}{\text{---}} \underset{0}{\text{---}} \underset{1}{\text{---}} \text{---} \text{---} \underset{0}{\text{---}} \underset{0}{\text{---}} \overset{\circ}{\text{---}} \underset{0}{\text{---}} \overset{\Delta}{\mathfrak{A}}$$

Plagal Fourth Mode - Sticheraric

0100100	
1000100	
X000100	
00100100	
000100100	

L) Accented on Fourth to Last Syllable

Nee - Di

1001

1010

01001

γ
 δ

0 1 0 0 1 Δ
 δ

γ
 δ

0 1 0 0 1 Δ
 δ

γ
 δ

0 1 0 0 1 Δ
 δ

γ
 δ

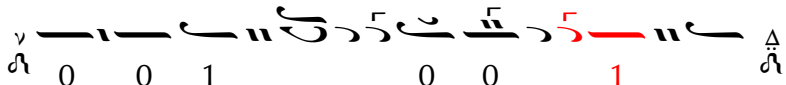

0 1 0 0 1 Δ
 δ

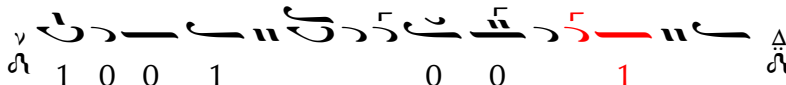

01010

γ
 δ

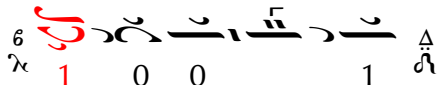

0 1 0 1 0 Δ
 δ

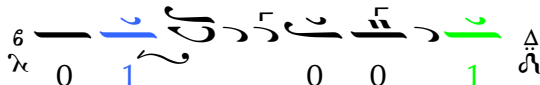


Plagal Fourth Mode - Sticheraric

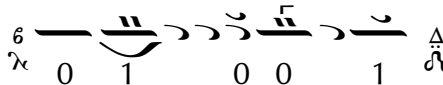
001001  

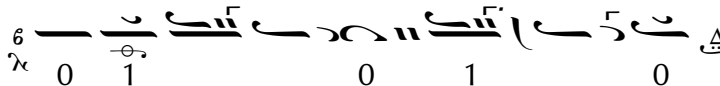
1001001  

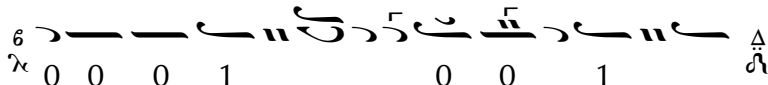
Vou - Di

1001  

01001   

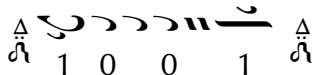


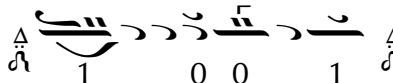
01010 

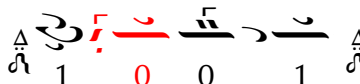
0001001 

Di - Di

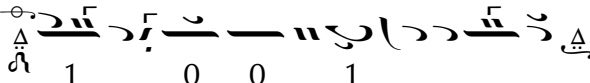
100X 

1001 









Plagal Fourth Mode - Sticheraric

$\overset{\Delta}{\text{A}}$ 1 0 0 1 $\overset{\Delta}{\text{A}}$

$\overset{\Delta}{\text{A}}$ 1 0 0 1 $\overset{\Delta}{\text{A}}$

$\overset{\Delta}{\text{A}}$ 1 0 0 1 $\overset{\Delta}{\text{A}}$

$\overset{\Delta}{\text{A}}$

$\overset{\Delta}{\text{A}}$

1010

$\overset{\Delta}{\text{A}}$ 1 0 1 0 $\overset{\Delta}{\text{A}}$

1X0X

$\overset{\Delta}{\text{A}}$ 1 X 0 X $\overset{\Delta}{\text{A}}$

01001

$\overset{\Delta}{\text{A}}$ 0 1 0 0 1 $\overset{\Delta}{\text{A}}$

$\overset{\Delta}{\text{A}}$ 0 1 0 0 1 $\overset{\Delta}{\text{A}}$

$\overset{\Delta}{\text{A}}$ 0 1 0 0 1 $\overset{\Delta}{\text{A}}$

$\overset{\Delta}{\text{A}}$ 0 1 0 0 1 $\overset{\Delta}{\text{A}}$

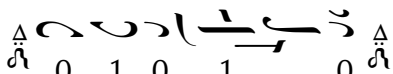
$\overset{\Delta}{\text{A}}$ 0 1 0 0 1 $\overset{\Delta}{\text{A}}$

$\overset{\Delta}{\text{A}}$ 0 1 0 0 1 $\overset{\Delta}{\text{A}}$

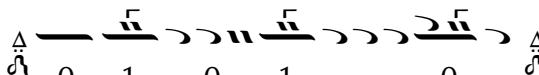
$\overset{\Delta}{\text{A}}$ 0 1 0 1

Plagal Fourth Mode - Sticheraric


0

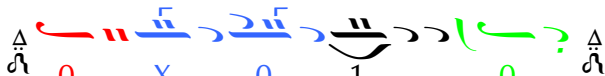
01010

0 1 0 1 0



0 1 0 1 0

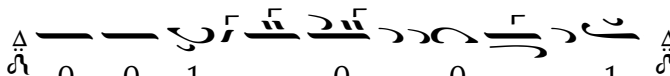

0 1 0 1 0

01X00

0 1 X 0 0

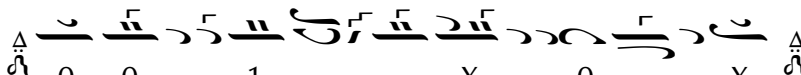
0X010

0 X 0 1 0

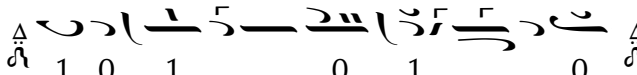

0 X 0 0

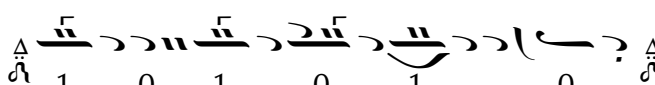
001001

0 0 1 0 0 1


0 0 1 0 0 1



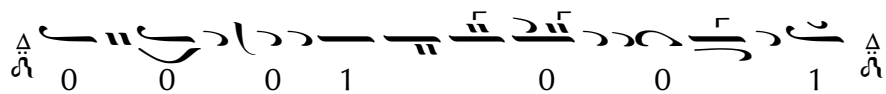
001X0X

0 0 1 X 0 X

101010

1 0 1 0 1 0


1 0 1 0 1 0

Plagal Fourth Mode - Sticheraric

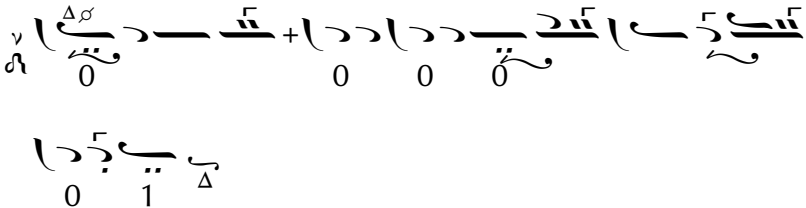
0001001

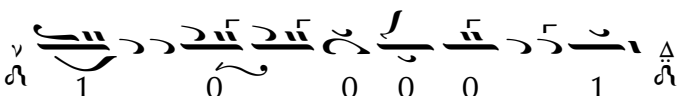


M) Medial Formulae Nee - Low Di

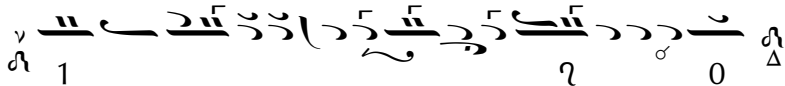
Accented on last syllable:

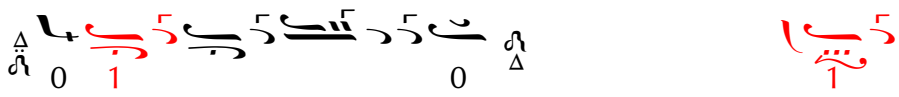
(A formula ending in 100 or 1001 may also be used for a phrase accentuated on the last syllable.)

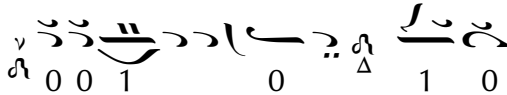
00001 (old sticheraric) 

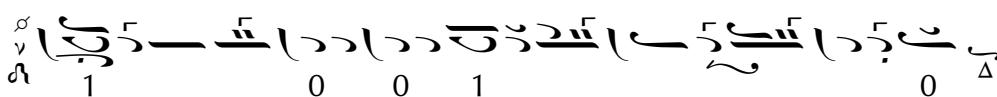
100001 

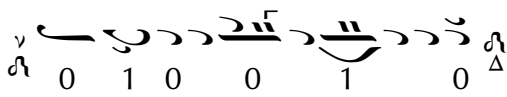
Accented on second to last syllable:

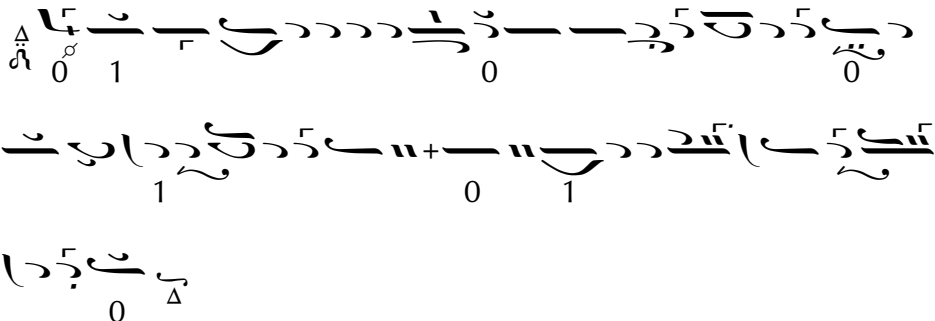
10 

010 

0010 

10010 

010010 

010010 (old sticheraric) 

Plagal Fourth Mode - Sticheric

100010
 Δ 1 0 0 0 1 0 Δ

Δ 1 0 0 0 1 0 Δ

0100010
 Δ 0 1 0 0 0 1 0 Δ

Δ 0 1 0 0 0 1 0 Δ

Accented on third to last syllable:

100
 Δ 1 0 0 0 0 Δ

00100
 Δ 0 0 1 0 0 Δ

Δ 0 0 1 0 0 Δ

Δ 0 0 1 0 0 Δ

000100
 Δ 0 0 0 1 0 0 Δ

000100
 Δ 0 0 0 1 0 0 0 1 0 Δ

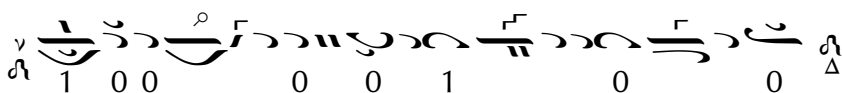
Δ 0 Δ

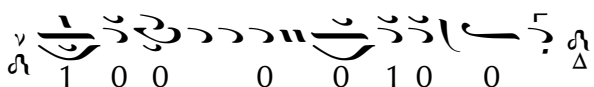
100100
 Δ 1 0 0 1 0 0 Δ

Δ 1 0 0 1 0 0 Δ

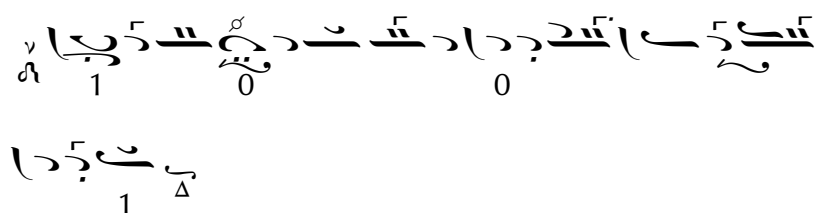
Plagal Fourth Mode - Sticheraric

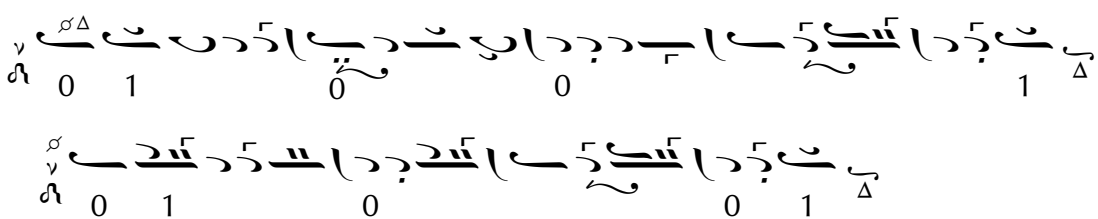
1000100


1000100


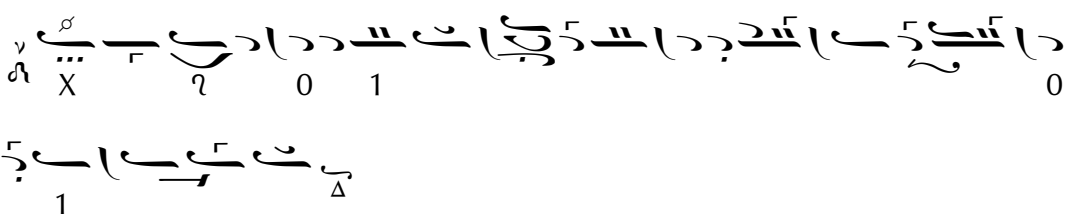
10000100


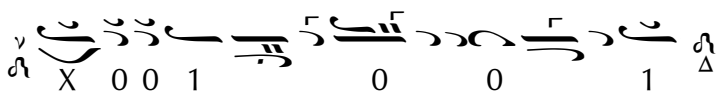
Accented on fourth to last syllable:

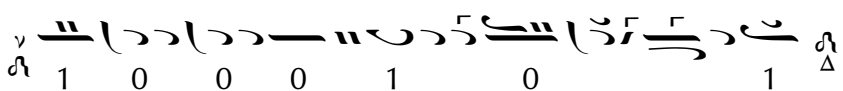
1001 (old sticheraric)


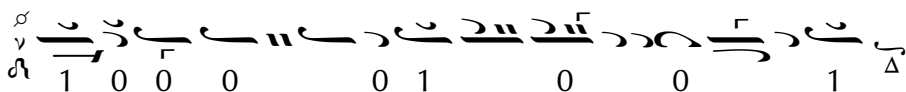
01001


001001


X01001



X001001


10001010


100001001


N) Medial Formulae Di - High Nee

Accented on last syllable:

1 (old sticheraric) 


01 (old sticheraric)

001 (old sticheraric)

001 $\frac{\Delta}{a} \frac{1}{0} \frac{1}{0} \frac{1}{1} \frac{1}{1} \frac{1}{1} \frac{1}{1}$


$$\begin{array}{c} \Delta \\ \mathcal{A} \end{array} \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \text{---} \\ 1 \end{array} \begin{array}{c} \text{---} \\ 1 \end{array} \begin{array}{c} \text{---} \\ n' \end{array} \quad \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \text{---} \\ 1 \end{array} \begin{array}{c} \text{---} \\ 1 \end{array}$$

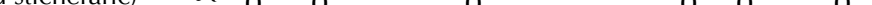
001 (old sticheraric)

001 (old sticheraric) 

001 (old sticheraric)
The notation consists of two parts separated by a plus sign. The first part has a delta symbol above a '2' and a '0' below a wavy line. The second part has a '0' below a hook, a '0' below a double bar, a '0' below a triple bar, and a '1' below a final flourish.

[illegible][illegible]

0001 (old sticheraric) 

0001 (old sticheraric) 

Plagal Fourth Mode - Sticheric

00001

10001

00100001

10

010

861

Plagal Fourth Mode - Sticheraric

6
λ

0 1 0

010 (old sticheraric)

0 1 0

00010 (old sticheraric)

0 0 0 1 0

10010 (old sticheraric)

1 0 0 1 0

10010 (old sticheraric)

1 0 0 1 0

00X010

100010

100010 (old sticheraric)

Accented on third to last syllable:

100

$\mathfrak{A}^{\vee}_1 \xrightarrow{\quad} \mathfrak{A}^{\vee}_0 \xrightarrow{\quad} \mathfrak{A}^{\vee}_0 \xrightarrow{\quad} \mathfrak{A}^{\vee}_1 \xrightarrow{\quad} \mathfrak{A}^{\vee}_1$
 $\mathfrak{A}^{\Delta}_1 \xrightarrow{\quad} \mathfrak{A}^{\Delta}_0 \xrightarrow{\quad} \mathfrak{A}^{\Delta}_0 \xrightarrow{\quad} \mathfrak{A}^{\Delta}_1 \xrightarrow{\quad} \mathfrak{A}^{\Delta}_1$

Plagal Fourth Mode - Sticheric

100 (old sticheraric)

١٥٨٠

0100

0100 (old sticheraric)

00100

Accented on fourth to last syllable:

1001

$$\frac{1}{1} \quad \frac{1}{1}$$

בְּיָמֵינוּ

[illegible]
$$\frac{1}{\partial} \frac{\Gamma}{1} \sim \frac{\Gamma}{0} \sim \frac{\Gamma}{0} \sim \frac{\Gamma}{1} \sim \frac{\Gamma}{n}$$

1001 (old sticheraric)

$\underbrace{\quad}_{\eta} \underbrace{\quad}_{\sigma} \underbrace{\quad}_{\eta'}$

01001

Plagal Fourth Mode - Sticheric

01001 (old sticheraric)
The notation consists of a sequence of notes on a four-line staff. The notes are: a half note on line 1 (labeled 0), a half note on line 2 (labeled 1), a half note on line 3 (labeled 0), a half note on line 4 (labeled 0), and a half note on line 1 (labeled 1). The notes are connected by a continuous line.

$\underbrace{\quad}_{\gamma} \underbrace{\quad}_{\alpha} \underbrace{\quad}_{\beta} \underbrace{\quad}_{\delta} \underbrace{\quad}_{\epsilon} \underbrace{\quad}_{\zeta} \underbrace{\quad}_{\eta} \underbrace{\quad}_{\theta} \underbrace{\quad}_{\iota} \underbrace{\quad}_{\kappa} \underbrace{\quad}_{\lambda} \underbrace{\quad}_{\mu} \underbrace{\quad}_{\nu} \underbrace{\quad}_{\xi} \underbrace{\quad}_{\omicron} \underbrace{\quad}_{\pi} \underbrace{\quad}_{\rho} \underbrace{\quad}_{\sigma} \underbrace{\quad}_{\tau} \underbrace{\quad}_{\upsilon} \underbrace{\quad}_{\phi} \underbrace{\quad}_{\chi} \underbrace{\quad}_{\psi} \underbrace{\quad}_{\omega} \underbrace{\quad}_{\gamma'} \underbrace{\quad}_{\eta'}$

Δ

001001

$a_0 \quad a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5 \quad a_6 \quad a_7$

n'

Diagram illustrating a sequence of elements in a group, represented by colored bars and associated symbols:

- Green bar: Δ above, 0 below.
- Green bar: 0 below.
- Red bar: Γ above, 1 below.
- Red bar: Γ above, 1 below.
- Black bar: Ψ above, 0 below.
- Black bar: Γ above, 0 below.
- Blue bar: Ψ above, 1 below.
- Blue bar: Ψ above, 1 below.
- Blue bar: Ψ above, 1 below.
- Symbol: $\gamma' n$

$$\frac{1}{0} + \frac{1}{0} = \frac{1}{1}$$

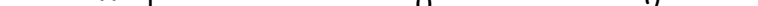
1

$$\frac{\Delta}{\partial \lambda} \frac{1}{0} \frac{1}{0} \rightarrow \frac{1}{1} \frac{1}{1} \rightarrow \frac{1}{0} \frac{1}{0} \rightarrow \frac{1}{1} \frac{1}{1} \rightarrow \frac{1}{0} \frac{1}{0} \rightarrow \frac{1}{1} \frac{1}{1}$$

From High Nee:

(Usually instead of these formulae, a formula from Di is used by subtracting three from the interval of the initial neume.)

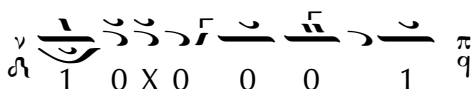
010 $\begin{array}{c} \gamma' \\ n \end{array} \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \text{---} \\ 1 \end{array} \begin{array}{c} \text{---} \\ 0 \end{array} \begin{array}{c} \gamma \\ q \end{array}$

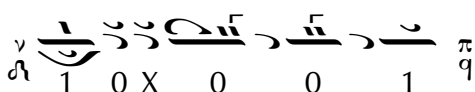
100 

[illegible][illegible]

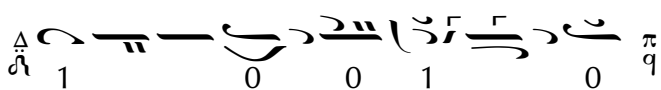
O) Cadences on Pa

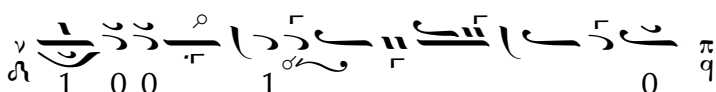
Accented on last syllable:

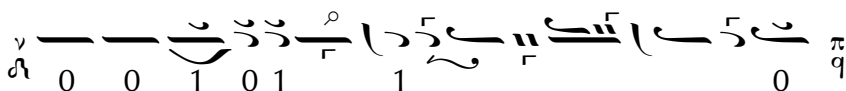
10X0001 

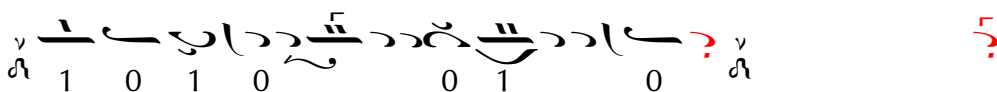
10X0001 

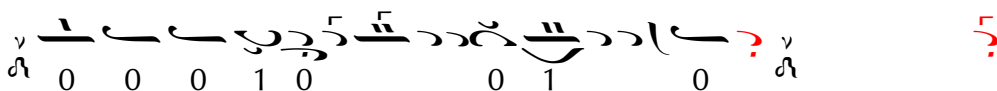
Accented on second to last syllable:

10010 



0010010 

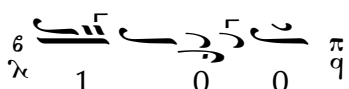
1010010 

00010010 

Accented on third to last syllable:

100  





Plagal Fourth Mode - Sticheric

0100

$\overset{\gamma}{\mathfrak{A}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\pi}{\mathfrak{q}}$

$\overset{\Delta}{\mathfrak{A}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\pi}{\mathfrak{q}}$

000100

$\overset{\gamma}{\mathfrak{A}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\pi}{\mathfrak{q}}$

Accented on fourth to last syllable:

1001

$\overset{\gamma}{\mathfrak{A}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\sim}{\text{—}} \overset{\pi}{\mathfrak{q}}$

P) Fthoras

Accented on last syllable:

001

0001

00001

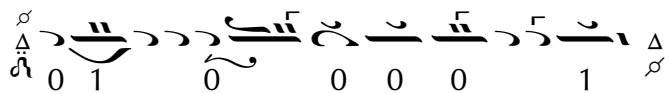
10001

010001

0010001

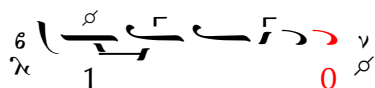
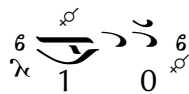
Plagal Fourth Mode - Sticheraric

0100001

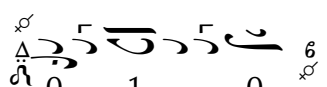
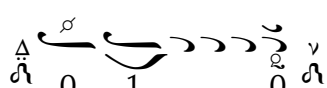
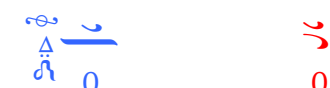
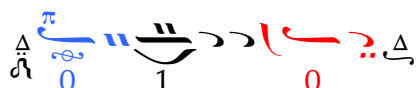
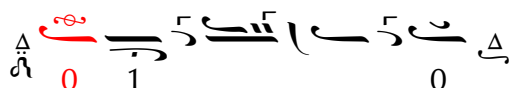
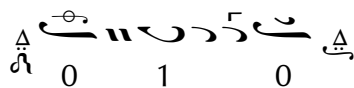


Accented on second to last syllable:

10



010



Plagal Fourth Mode - Sticheraric

0010

0-2

$$\begin{array}{ccccccc} \begin{array}{c} 6 \\ \gamma \end{array} & \begin{array}{c} \text{---} \\ \text{---} \end{array} & \begin{array}{c} \text{---} \\ \text{---} \end{array} & \begin{array}{c} \text{---} \\ \text{---} \end{array} & \begin{array}{c} \text{---} \\ \text{---} \end{array} & \begin{array}{c} \text{---} \\ \text{---} \end{array} & \begin{array}{c} 6 \\ \gamma \end{array} \\ 0 & 1 & & & 0 & & \end{array}$$
$$\Delta_{\text{A}} \quad \text{0} \quad \text{0} \quad \text{1} \quad \text{0} \quad \Delta_{\text{B}}$$
$$\Delta \begin{pmatrix} 0 & 0 & 1 & 0 \end{pmatrix} \pi$$
$$\begin{array}{ccccccc} 6 & & & & \sigma & & \gamma \\ \chi & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ & 0 & 0 & 1 & 0 & 0 & 0 \end{array}$$
$$\begin{array}{ccccccc} \delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \pi \\ \delta & 0 & 0 & 1 & & & 0 \end{array}$$
$$\begin{array}{ccccccc} \alpha & & & & & & \\ \Delta & & & & & & \\ \delta & & & & & & \pi, \end{array} \quad \begin{array}{ccccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 0 & 1 & & & & 0 \end{array}$$
[illegible]

00010

$$\gamma \begin{array}{ccccccc} \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 0 & 0 & 1 & \text{---} & \text{---} & 0 \end{array} \Delta$$

10010

Δ
 \mathcal{A}
 Δ

1

$$y_{\alpha} = \frac{1}{\alpha} \left(\frac{1}{1} \frac{1}{0} \frac{1}{0} \frac{1}{1} \frac{1}{0} \frac{1}{0} \right) \frac{1}{\alpha}$$
$$\Delta_{\mathfrak{A}} \begin{pmatrix} 1 & 0 & 0 & 1 & 0 \end{pmatrix} \Delta_{\mathfrak{A}}$$
[illegible]
$$\frac{\Delta}{\Delta} \left(\frac{1}{1} - \frac{1}{0} - \frac{1}{0} - \frac{1}{1} - \frac{1}{0} \right) \frac{\Delta}{\Delta}$$

Plagal Fourth Mode - Sticheric

010010

100010

0100010

Accented on third to last syllable:

100

101

0100

Plagal Fourth Mode - Sticheraric

ⲁ

ⲟ

00100

ⲁ — — — — — ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ

ⲁ — — — — — ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ

ⲁ — — — — — ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ

10100

ⲁ — — — — — ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ

ⲁ — — — — — ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ

10101

ⲁ — — — — — ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ

100100

ⲁ — — — — — ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ

ⲁ — — — — — ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ

ⲁ — — — — — ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ

010100

ⲁ — — — — — ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ

01010X

ⲁ — — — — — ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ

0010100

ⲁ — — — — — ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ

0100100

ⲁ — — — — — ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ ⲟ

Plagal Fourth Mode - Sticheraric

Accented on fourth to last syllable:

1010

1010

01010

100010

Q) Old (slow) Sticheraric Formulae

Accented on last syllable:

Cadences on Nee:

01

01

001

001

1000001

100X001

0100001

Cadences on Vou:

01

01

001

Cadences on Di:

1

Plagal Fourth Mode - Sticheric

01

001

001

0001

0001

010001

Other Cadences:

1

01

001

0001

00001

000001

Plagal Fourth Mode - Sticheric

Accented on second to last syllable:

Cadences on Nee:

10	
010	
010	
010	
010	
010	
010	
010	
010	
0010	

Plagal Fourth Mode - Sticheric

0010		
00010		
0X010		
00010		
10010		
10010		
10010		
010010		
010010		
010010		
100010		
100010		
100010		

Plagal Fourth Mode - Sticheraric

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99

Plagal Fourth Mode - Sticheraric

00100010

10000010

Cadences on Vou:

10

10

010

010

010

0010




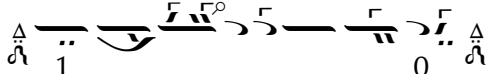
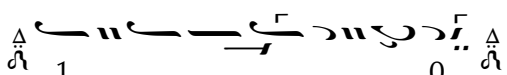
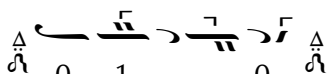
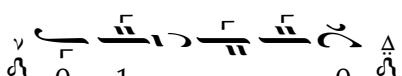

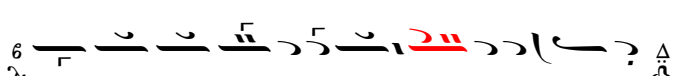

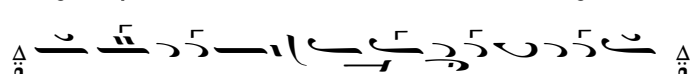

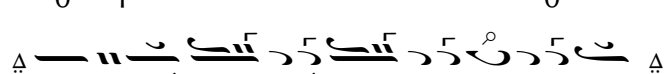
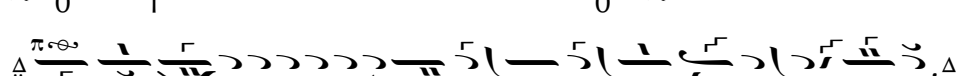

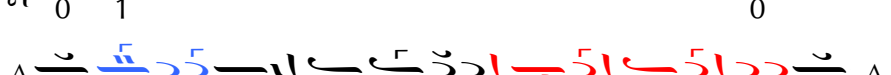
00010

000010

000010

Plagal Fourth Mode - Sticheraric

Cadences on Di:

10		
10		
10		
10		
10		
010		
010		
010		
010		
010		
010		
010		
010		
010		
010		

Plagal Fourth Mode - Sticheric

010	
110	
00010	
00010	
00010	
10010	
010010	
010010	
010010	
100010	
100010	
100010	

Plagal Fourth Mode - Sticheric

Other Cadences:

- 10
- 010
- 0010
- 0010
- 0010
- 10010
- 10010
- 10010
-
-

Plagal Fourth Mode - Sticheraric

010010

010010

0010010

Accented on third to last syllable:

Cadences on Nee:

100

100

100

100

100

100

Plagal Fourth Mode - Sticheric

0100

0100

010X

0100

00100

00100

00100

00100

00100

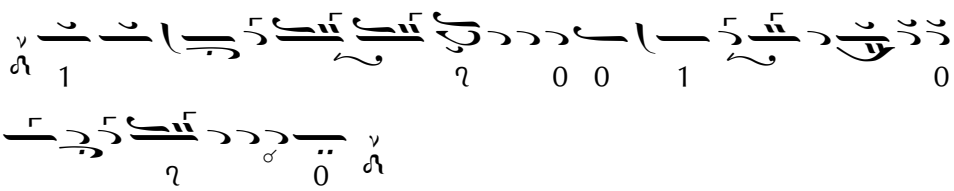
00100

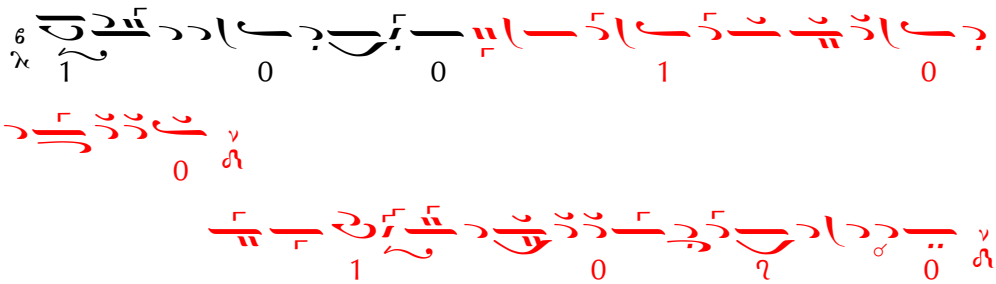
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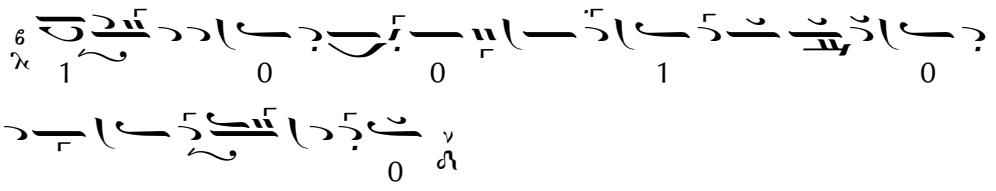
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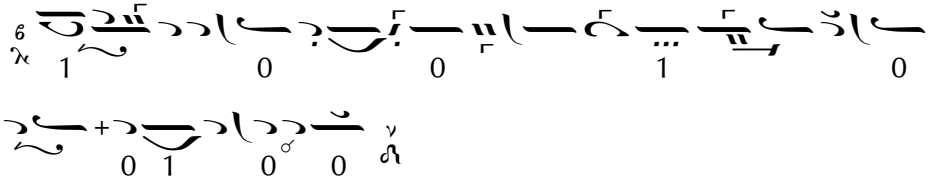
000100

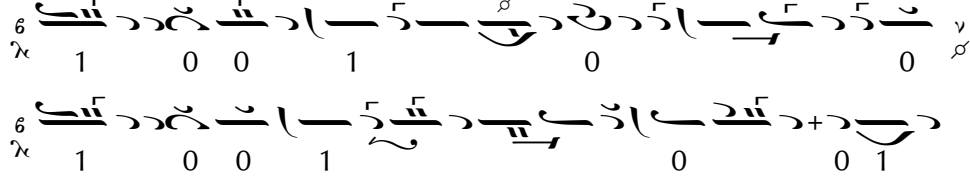
Plagal Fourth Mode - Sticheric

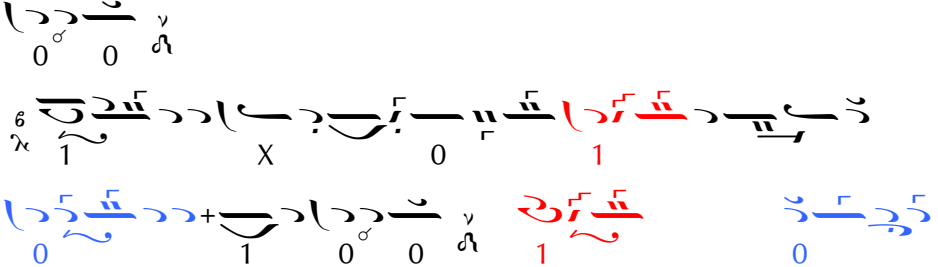
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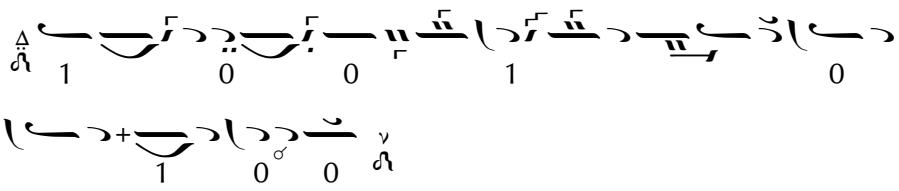
100100 


100100 

100100 

100100 

100100 

100100 

100100 

Plagal Fourth Mode - Sticheraric

100100	
100100	
100100	
100100	
1000100	
1000100	
1000100	
1000100	
1000100	
1000100	
1000100	
1000100	
1000100	
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1000100	
1000100	
1000100	

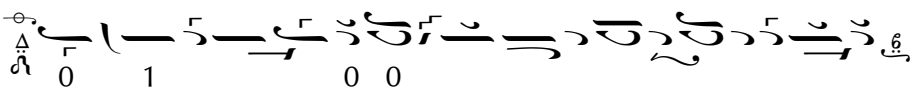
Cadences on Vou:

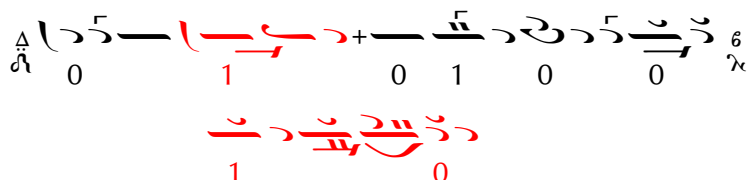
100 γ_{λ}^6 $\frac{1}{1} - \frac{1}{0} \frac{1}{0} \frac{1}{0} \gamma_{\lambda}^6$

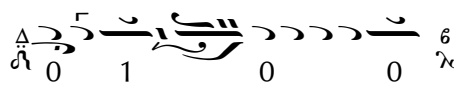
100 γ_{λ}^6 $\frac{1}{1} - \frac{1}{0} \frac{1}{1} \frac{1}{0} \frac{1}{0} \gamma_{\lambda}^6$

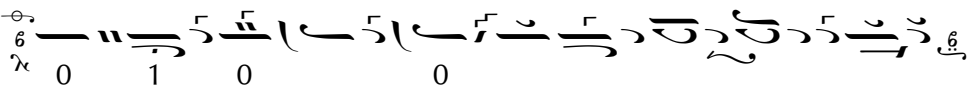
100 γ_{λ}^6 $\frac{1}{1} - \frac{1}{0} \frac{1}{0} \frac{1}{1} \frac{1}{0} \frac{1}{0} \gamma_{\lambda}^6$

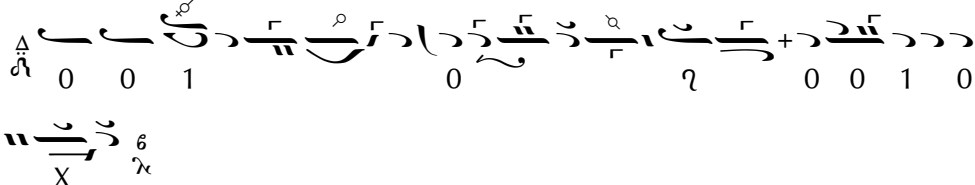
Plagal Fourth Mode - Sticheraric

0100 


0100 

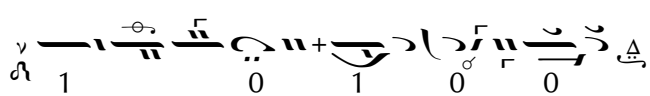
0100 

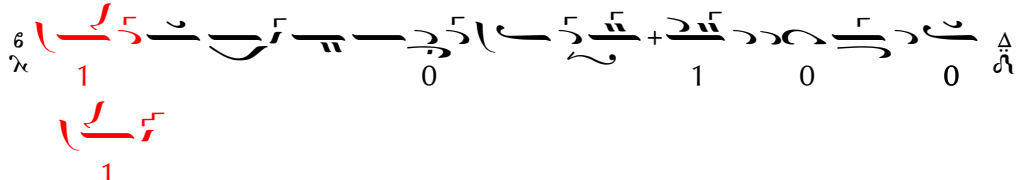
0100 

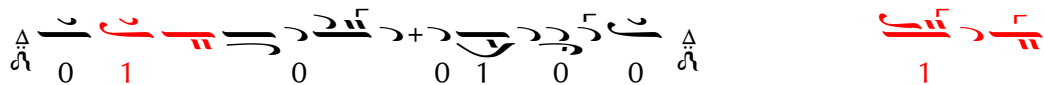
0010X 

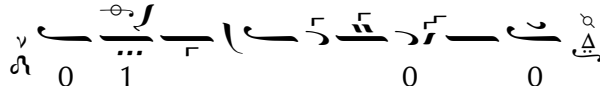
Cadences on Di:

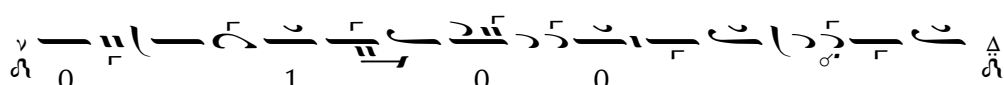
100 

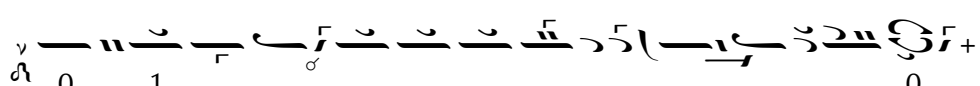
100 

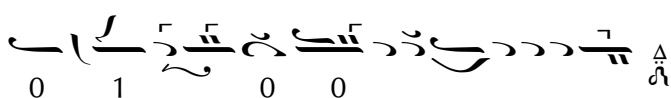
100 

0100 

0100 

0100 

0100 



Plagal Fourth Mode - Sticheric

[illegible]

Plagal Fourth Mode - Sticheraric

[illegible]

Plagal Fourth Mode - Sticheric

0000100	
0000100	
0100100	
0100100	
1000100	
1000100	

Other Cadences:

100

0100

0100

0100

00100

Plagal Fourth Mode - Sticheraric

	$\frac{1}{0} \text{ } \overset{r}{n}$
00100	$\overset{v}{d} \frac{1}{0} \rightarrow \frac{1}{0} \rightarrow \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \rightarrow \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \text{ } \overset{r}{n}$
00100	$\overset{6}{\lambda} \frac{1}{0} \rightarrow \frac{1}{0} \rightarrow \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \rightarrow \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \text{ } \overset{\pi}{q}$
10100	$\overset{6}{\lambda} \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \text{ } \overset{r}{n}$
10100	$\overset{6}{\lambda} \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \text{ } \overset{r}{n}$
100100	$\overset{\Delta}{d} \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \rightarrow \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \rightarrow \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \text{ } \overset{r}{n}$
	$\frac{1}{0} \text{ } \overset{r}{n}$
1000100	$\overset{\Delta}{d} \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \rightarrow \frac{1}{1} \rightarrow \frac{1}{0} \rightarrow \frac{1}{0} \rightarrow \frac{1}{1} \rightarrow \frac{1}{0} \text{ } \overset{r}{n}$
	$\frac{1}{0} \text{ } \overset{r}{n}$

Accented on fourth to last syllable:

Cadences on Nee:

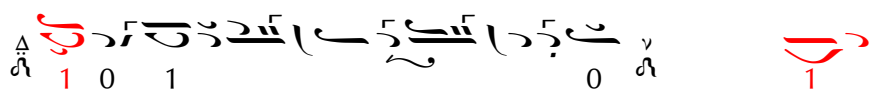
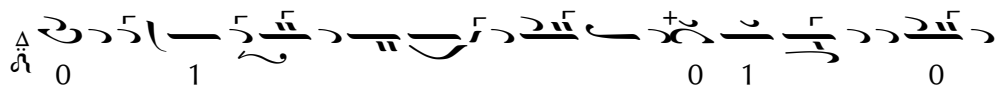
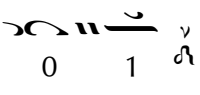
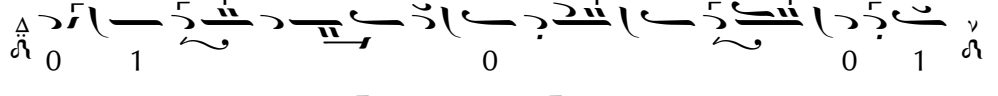
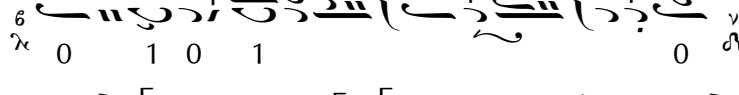
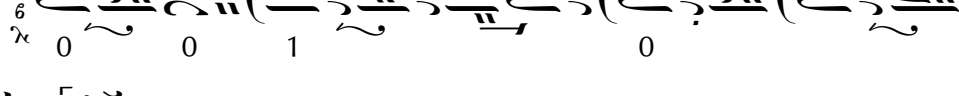
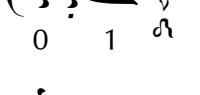
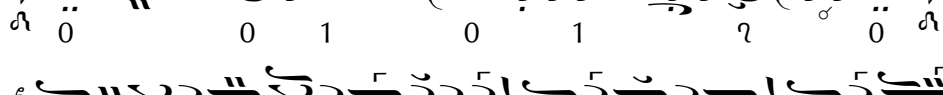
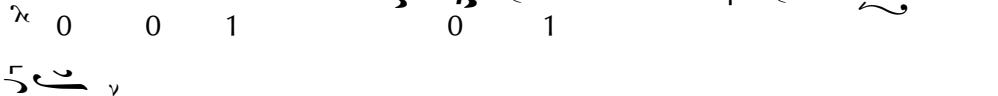
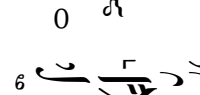
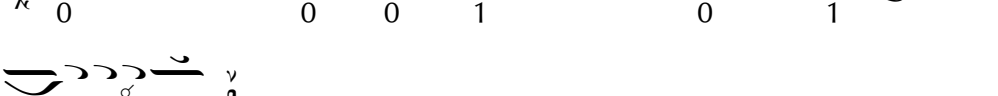
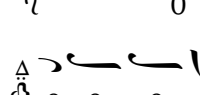
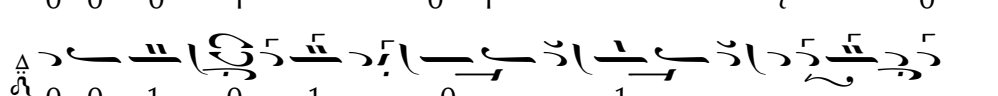

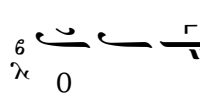


1001

1001

1010

1010

Plagal Fourth Mode - Sticheric

1010	
01001	
	
01001	
01010	
001001	
	
001010	
001010	
	
0001010	
	
0001010	
00101010	
	
00001010	
	

Plagal Fourth Mode - Sticheraric

Cadences on Vou:

1010

001001

Cadences on Di:

1001

1001

01001

01001

01001

01010

01010

01100

001010

Plagal Fourth Mode - Sticheraric

101010

Other Cadences:

1010

h1010

01001

0101001

R) Final Cadences

Accented on last syllable:

X0X0X0X Δ Δ

Δ

Δ

Δ

100X0X0X Δ Δ

Δ

Δ

Δ

Accented on second to last syllable:

0010010 Δ Δ

Δ

1000010 Δ Δ

Plagal Fourth Mode - Sticheric

0 1

1000010 1 0 0 0 0 1 0

00100010 0 0 1 0 0 0 1 0

0 1

Accented on third to last syllable:

0010X 0 0 1 0 X

010100 0 1 0 1 0 0

10010X 1 0 0 1 0 X

10010X 1 0 0 1 0 X

1 0 0

1 0 0

1 0

1 0

Plagal Fourth Mode - Sticheric

10010X

♩ 1 0 0 1 0 0 ♩

♩ 1 0 0

♩ 1 0 0

♩ 1 0 0 1 0 0 ♩

♩ 1 0 0 1 0 0 ♩

♩ 1 0 0 0 1 0 0 ♩

100010X

♩ 1 0 0 0 1 0 X ♩

♩ 1 0 0 0

♩ 1 0 0 0 1 0

♩ 1 0

♩ 1 0

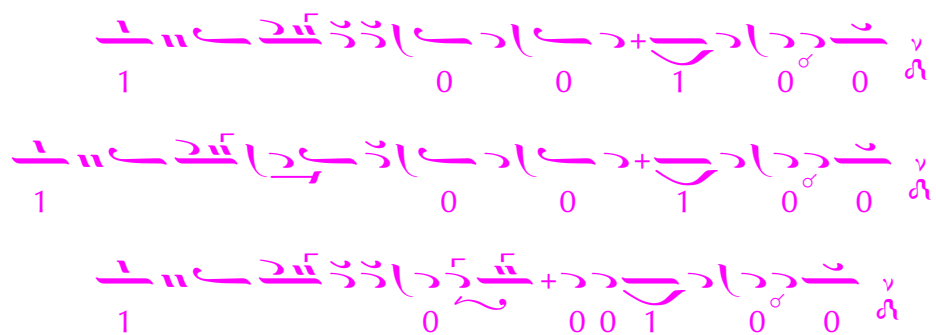
100010X

♩ 1 0 0 0 1 0 0 ♩

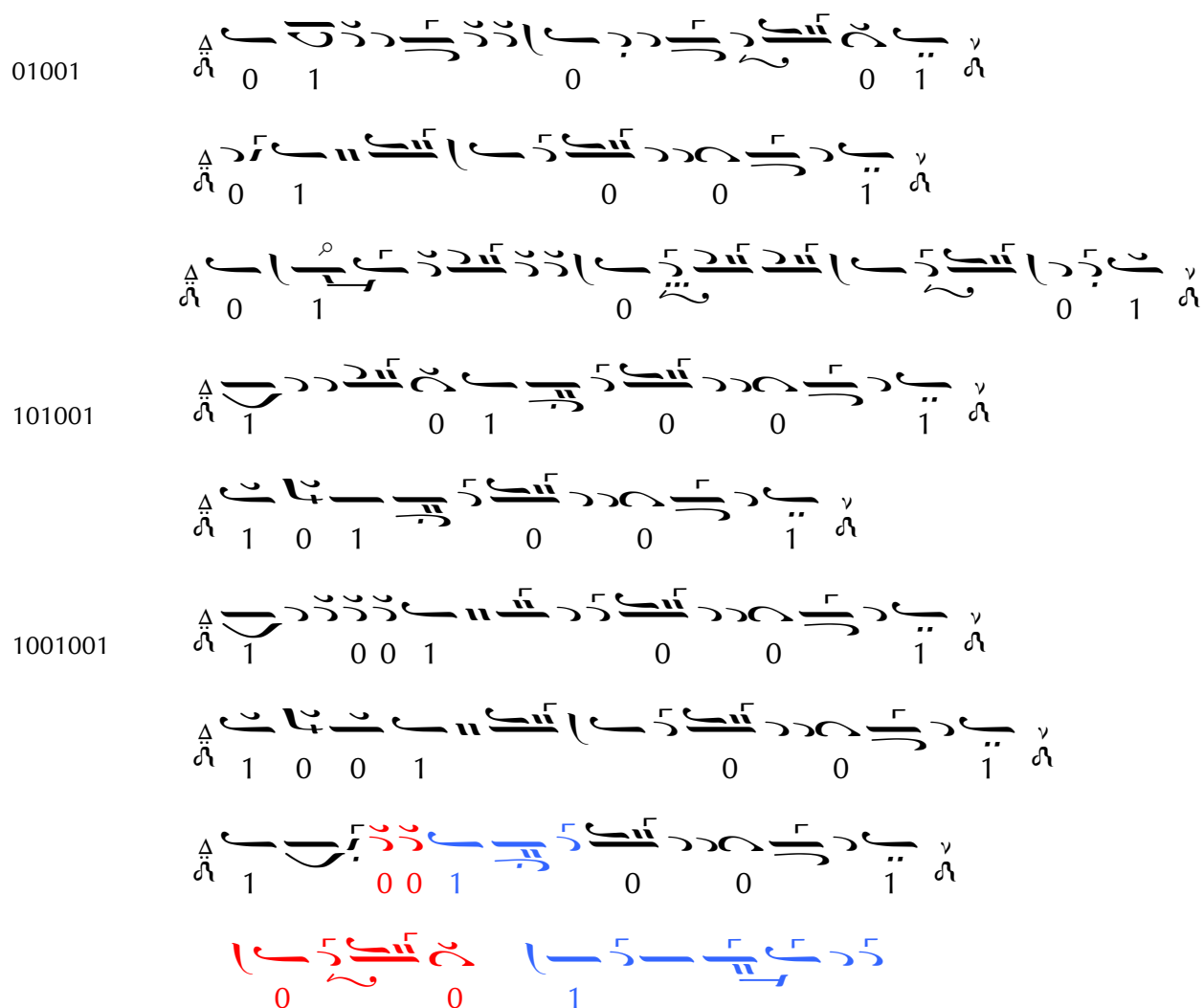
♩ 1 0 0 0

♩ 1 0 0 0

Plagal Fourth Mode - Sticheraric



Accented on fourth to last syllable:



Plagal Fourth Mode - Sticheraric

10001001 Δ 1 0 0 0 1 0 0 1 γ

1001010 Δ 1 0 0 1 0 1 0 γ

S) Final Cadences for Theotokia

Accented on last syllable and/or third to last syllable:

00101


$\Delta_{\mathcal{A}}$


0 0 1 0 0 0 1 0 1

$\gamma_{\mathcal{B}}$

010X0X 0 1 0 X 0 X

100100

Δ
 \mathfrak{A}  \mathfrak{A}

Δ
 \mathfrak{A}  \mathfrak{A}

100X0X

1000100

$\begin{array}{ccccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ \delta_1 & 1 & & 0 & & 0 & & 0 & 1 \end{array}$

$\begin{array}{ccccccccccc} & \text{---} & \text{---} & + & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \gamma \\ & 0 & \text{---} & & 0 & 0 & 1 & & 0 & 1 & \delta \end{array}$

1000101

Δ
 \mathfrak{A}
 γ
 \mathfrak{A}

100010X

[illegible]

၇၂၁

Plagal Fourth Mode - Sticheraric

Accented on fourth to last syllable:

01001

Δ

δ_1

0

1

0

0

1

γ

δ_1

101001

1 0 1 0 0 1 0

BYZANTINE MUSIC FORMULAE

Plagal Fourth Mode - Heirmologic

Contents^{*}

A) Medial Cadences on Nee	902
B) Medial Cadences on Vou	909
C) Medial Cadences on Di.....	914
D) Formulae with Fthores	931
E) Ending Formulae.....	934
F) Endings for Theotokia	936

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

* The Byzantine music formulae herein were extracted from heirmologic melodies found in the Zoe Anastasimatarion (14th edition, 2002).

A) Medial Cadences on Nee

Accented on last syllable:

From Nee

00 $\overset{\gamma}{\text{d}} \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } \overset{\gamma}{\text{d}}$

From Vou

010001 $\overset{6}{\lambda} \text{ — } 0 \text{ — } 1 \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } \overset{\gamma}{\text{d}}$ $\text{ — } 1 \text{ — } ?$

0010001 $\overset{6}{\lambda} \text{ — } 0 \text{ — } 0 \text{ — } 1 \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } \overset{\gamma}{\text{d}}$ $\text{ — } 1 \text{ — } ?$

100010001 $\overset{6}{\lambda} \text{ — } 1 \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } 1 \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } 1 \text{ — } \overset{\gamma}{\text{d}}$

From Di

00001 $\overset{\Delta}{\text{d}} \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } 1 \text{ — } \overset{\gamma}{\text{d}}$

010001 $\overset{\Delta}{\text{d}} \text{ — } 0 \text{ — } 1 \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } 1 \text{ — } \overset{\gamma}{\text{d}}$ $\text{ — } 1 \text{ — } 0$

0010001 $\overset{\Delta}{\text{d}} \text{ — } 0 \text{ — } 0 \text{ — } 1 \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } \overset{\gamma}{\text{d}}$

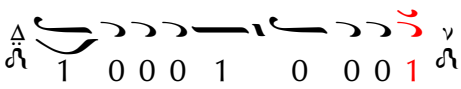

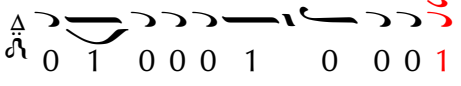


$\overset{\Delta}{\text{d}} \text{ — } 0 \text{ — } 0 \text{ — } 1 \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } 1 \text{ — } \overset{\gamma}{\text{d}}$ $\text{ — } 1 \text{ — } 0$

0100001 $\overset{\Delta}{\text{d}} \text{ — } 0 \text{ — } 1 \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } 1 \text{ — } \overset{\gamma}{\text{d}}$

01010001 $\overset{\Delta}{\text{d}} \text{ — } 0 \text{ — } 1 \text{ — } 0 \text{ — } 1 \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } 1 \text{ — } \overset{\gamma}{\text{d}}$


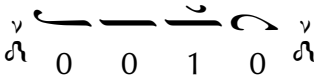
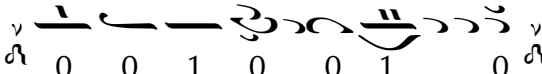
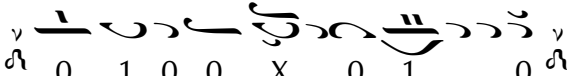
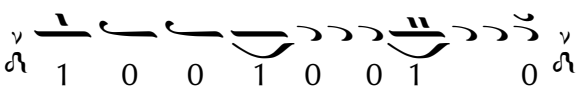
100010001 $\overset{\Delta}{\text{d}} \text{ — } 1 \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } 1 \text{ — } 0 \text{ — } 0 \text{ — } 0 \text{ — } 1 \text{ — } \overset{\gamma}{\text{d}}$

Plagal Fourth Mode - Heirmologic

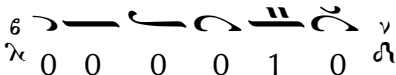
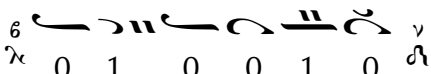
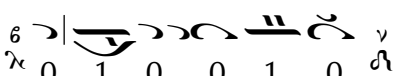
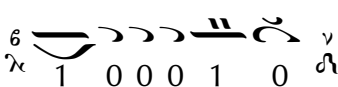
		
0100010001		
0100100001		

Accented on second to last syllable:

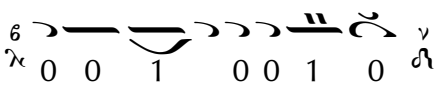
From Nee

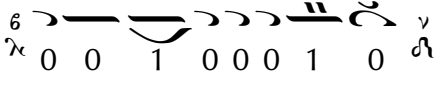
10	
0010	
0010010	
0100X010	
10010010	

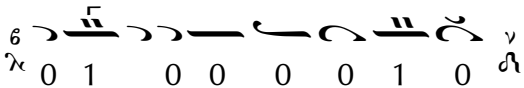
From Vou

000010	
010010	
	
100010	

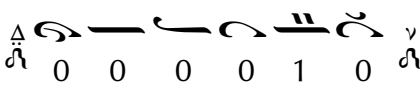
Plagal Fourth Mode - Heirmologic

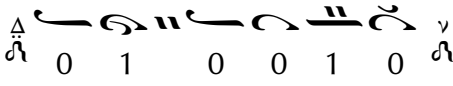
0010010 

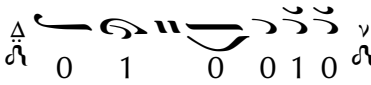
00100010 

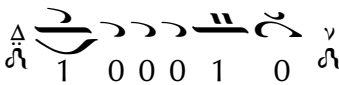
01000010 


From Di

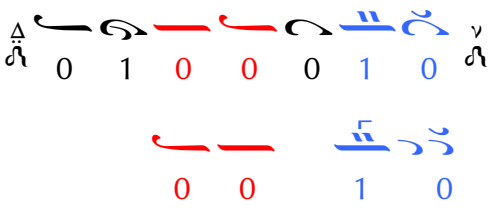
000010 

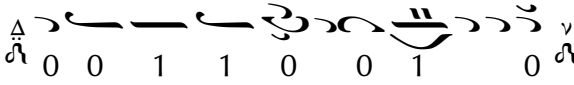
010010 

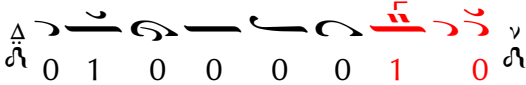


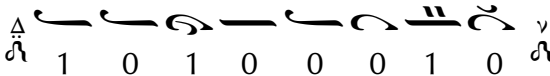
100010 

110010 

0100010 

00110010 

01000010 

10100010 



Plagal Fourth Mode - Heirmologic

10X00010	
010010010	
110000010	
100010010	
100100010	
1001000010	

Accented on third to last syllable:

From Nee

100	
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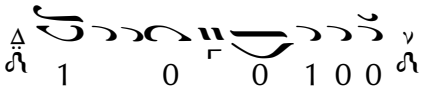
From Vou


10X0100	
00100100	
010000100	

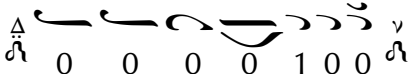
From Di

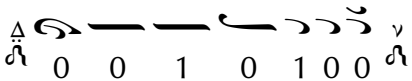
0X0100	
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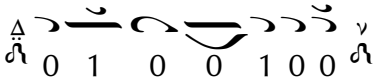
Plagal Fourth Mode - Heirmologic


100100 



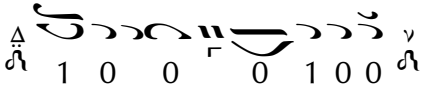
0000100 

0010100 

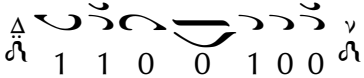
0100100 

1000100 

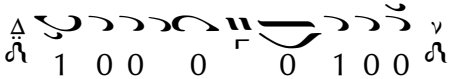


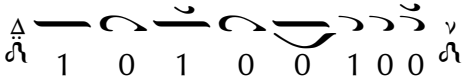


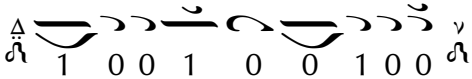
100010X 

1100100 

010X0100 

10000100 

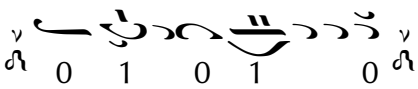
10100100 


100100100 

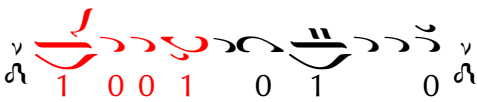
Accented on fourth to last syllable:

Plagal Fourth Mode - Heirmologic

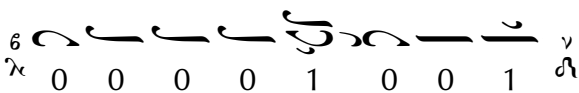
From Nee

01010 
 0 1 0 1 0

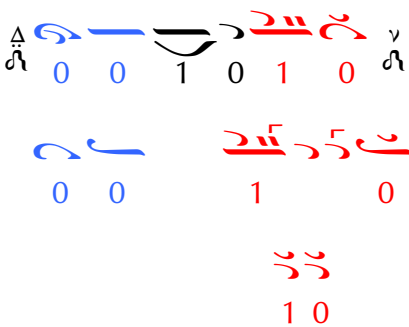
0111010 
 0 1 1 1 0 1 0

1001010  
 1 0 0 1 0 1 0 1 0 0 1

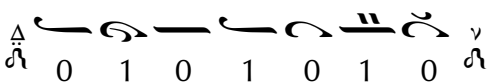
From Vou

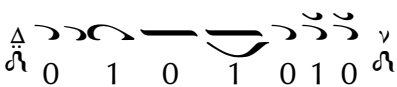
00001001 
 0 0 0 0 1 0 0 1

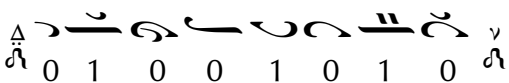
From Di

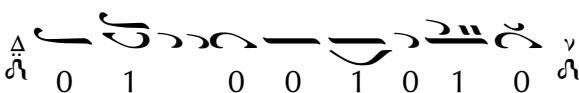
001010 
 0 0 1 0 1 0
 0 0 1 0
 1 0

0001001  
 0 0 0 1 0 0 1 1

0101010 
 0 1 0 1 0 1 0


 0 1 0 1 0 1 0

01001010 
 0 1 0 0 1 0 1 0


 0 1 0 0 1 0 1 0

Plagal Fourth Mode - Heirmologic

10001001	 1 0 0 0 1 0 0 1 y	
	 1 0 0 0 1 0 0 1 y	 1
010001010	 0 1 0 0 0 1 0 1 0 y	 1 0
110001010	 1 1 0 0 0 1 0 1 0 y	
0001001001	 0 0 0 1 0 0 1 0 0 1 y	 1

B) Medial Cadences on Vou

Accented on last syllable:

From Nee

$$00 \quad \gamma \quad \overline{\gamma} \quad 0 \quad 0 \quad \gamma$$

From Vou

$$00 \quad \begin{array}{c} \epsilon \\ \nearrow \\ \lambda \end{array} \quad \begin{array}{c} \epsilon \\ \searrow \\ \lambda \end{array}$$
$$\begin{array}{ccccc} \epsilon & \frown & & \frown & \epsilon \\ \lambda & & 0 & & \lambda \end{array}$$
$$000 \quad \begin{array}{c} \epsilon \\ \nearrow \\ \lambda_0 \end{array} \quad \begin{array}{c} \epsilon \\ \nearrow \\ \lambda_0 \end{array} \quad \begin{array}{c} \epsilon \\ \nearrow \\ \lambda_0 \end{array} \quad \begin{array}{c} \epsilon \\ \nearrow \\ \lambda_0 \end{array}$$

0100001

$\overset{6}{\lambda}$
 $\overset{6}{\lambda}$

From Di

$$00 \quad \begin{array}{ccc} \Delta & \hookrightarrow & 6 \\ \ddot{a} & 0 & 0 \\ & & \lambda \end{array}$$

Accented on second to last syllable:

From Nee

10 $\begin{matrix} & \gamma & & 6 \\ & \alpha & & \lambda \\ & 1 & & 0 \end{matrix}$

0010010

γ
 δ
 ϵ
 λ

Plagal Fourth Mode - Heirmologic

01000010

From Vou

10

00010

000010

0010010

From Di

010

0010

Accented on third to last syllable:

From Nee

100

Plagal Fourth Mode - Heirmologic

0100

00100

000100

010100

100100

0010100

00010100

10100100

000100100

010000100

0100010100

From Vou

100

Plagal Fourth Mode - Heirmologic

00100 $\begin{array}{c} \overset{6}{\lambda} \text{---} \text{---} \text{---} \text{---} \overset{6}{\lambda} \\ 0 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$ $\begin{array}{c} \text{---} \text{---} \\ 0 \quad 1 \end{array}$

100100 $\begin{array}{c} \overset{6}{\lambda} \text{---} \text{---} \text{---} \text{---} \overset{6}{\lambda} \\ 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$

0100100 $\begin{array}{c} \overset{6}{\lambda} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{6}{\lambda} \\ 0 \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$

00010100 $\begin{array}{c} \overset{6}{\lambda} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{6}{\lambda} \\ 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$

From Di

00100 $\begin{array}{c} \overset{\Delta}{\delta} \text{---} \text{---} \text{---} \text{---} \overset{6}{\lambda} \\ 0 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$ $\begin{array}{c} \text{---} \\ 0 \end{array}$

0010X $\begin{array}{c} \overset{\Delta}{\delta} \text{---} \text{---} \text{---} \text{---} \overset{6}{\lambda} \\ 0 \quad 0 \quad 1 \quad 0 \quad X \end{array}$

10100 $\begin{array}{c} \overset{\Delta}{\delta} \text{---} \text{---} \text{---} \text{---} \overset{6}{\lambda} \\ 1 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$

000110 $\begin{array}{c} \overset{\Delta}{\delta} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{6}{\lambda} \\ 0 \quad 0 \quad 0 \quad 1 \quad 1 \quad 0 \end{array}$

100100 $\begin{array}{c} \overset{\Delta}{\delta} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{6}{\lambda} \\ 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$

$\begin{array}{c} \text{---} \\ 1 \end{array}$

$\begin{array}{c} \text{---} \\ 1 \end{array}$

0010100 $\begin{array}{c} \overset{\Delta}{\delta} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{6}{\lambda} \\ 0 \quad 0 \quad 1 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$

0100100 $\begin{array}{c} \overset{\Delta}{\delta} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{6}{\lambda} \\ 0 \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \end{array}$

Plagal Fourth Mode - Heirmologic



Accented on fourth to last syllable:

From Nee

1000	
01001	
01010	

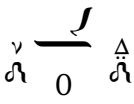
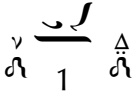
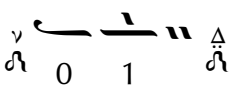
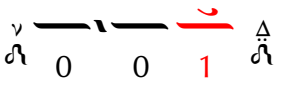

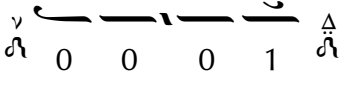
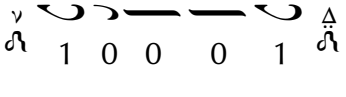

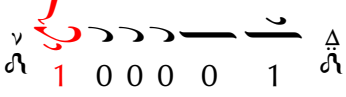

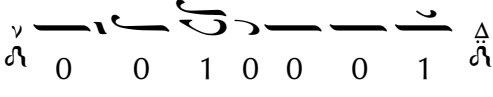
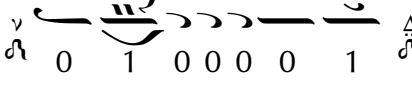
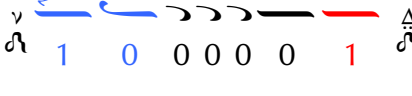
From Di

1010	
01010	
001010	
001X00	
0001010	

C) Medial Cadences on Di

Accented on last syllable:

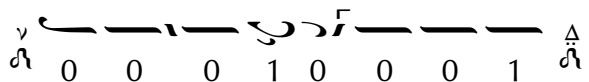
From Nee

0		
1		
01		
001		
0001		
10001		
010001		
100001		
0010001		
0100001		
1000001		

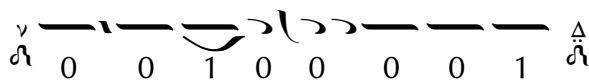
Plagal Fourth Mode - Heirmologic



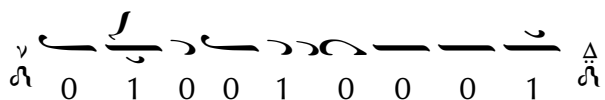
00010001



00100001



010010001



100010001

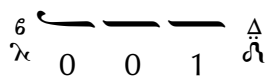


1000100001

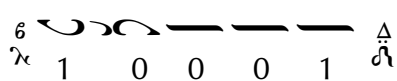


From Vou

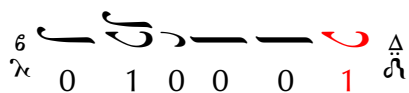
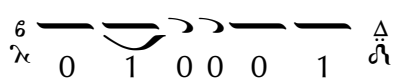
001



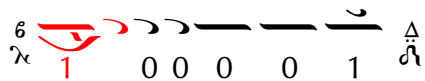
10001



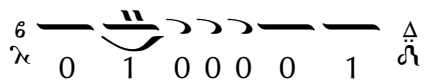
010001



100001



0100001



Plagal Fourth Mode - Heirmologic

10X0001

[illegible]

From Di

00

$$\begin{array}{c} \Delta \\ \vdots \\ \text{A} \end{array} \quad \begin{array}{c} \text{---} \\ 0 \end{array} \quad \begin{array}{c} \Delta \\ \vdots \\ \text{A} \end{array}$$

0

0000

$$\begin{array}{ccccccc} \Delta & \frown & \frown & \frown & \frown & \frown & \Delta \\ \text{A} & & & & & & \text{A} \\ 0 & 0 & 0 & 0 & 0 & & \end{array}$$

001

$$\begin{array}{c} \Delta \\ \textcircled{\cdot\cdot} \\ \textcircled{\cdot\cdot} \end{array} \quad \curvearrowright \quad \text{---} \quad \text{---} \quad \text{---} \quad \begin{array}{c} \Delta \\ \textcircled{\cdot\cdot} \\ \textcircled{\cdot\cdot} \end{array}$$

0 0 1

0001

$$\frac{1}{1}$$
$$\begin{array}{ccccccc} \Delta & \curvearrowright & \text{---} & \text{---} & \text{---} & \Delta \\ \mathfrak{A} & & 0 & 0 & 0 & 1 & \mathfrak{A} \end{array}$$

10001

Δ

1 0 0 0 1

1

010001

$$\frac{\gamma}{0}$$

Diagram illustrating a 1D chain with 6 sites. The sites are labeled 0, 1, 0, 0, 0, 1. The chain is represented by a horizontal line with arrows indicating the direction of the chain. The sites are connected by horizontal lines. The first and last sites are labeled with a spin-1/2 symbol. The second and fifth sites are labeled with a spin-1/2 symbol. The third, fourth, and sixth sites are labeled with a spin-1/2 symbol.

1

100001

$$\overset{\Delta}{\underset{\mathfrak{A}}{\curvearrowright}} \quad \underset{1}{\curvearrowright} \quad \underset{0}{\curvearrowright} \quad \underset{0}{\curvearrowright} \quad \text{---} \quad \text{---} \quad \text{---} \quad \underset{1}{\curvearrowright} \quad \overset{\Delta}{\underset{\mathfrak{A}}{\curvearrowright}}$$


1

Plagal Fourth Mode - Heirmologic

110001

0100001

01000001

010010001

110000001

10000100001

Accented on second to last syllable:

From Nee

[illegible]

Plagal Fourth Mode - Heirmologic

1

$$\begin{array}{c} \gamma \\ \mathfrak{A} \end{array} \overline{\begin{array}{c} \text{---} \text{---} \text{---} \text{---} \end{array}} \begin{array}{c} \Delta \\ \mathfrak{A} \end{array}$$
$$\begin{array}{ccccccc} \gamma & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \mathfrak{A} & 0 & 0 & 1 & 0 & \mathfrak{A} & \end{array}$$
$$\begin{array}{ccccccc} \gamma & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \mathfrak{A} & 0 & 0 & 0 & 1 & 0 & \mathfrak{A} \end{array}$$

1 0

1 0

$$\begin{array}{ccccccccc} \gamma & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \mathfrak{A} & 1 & 0 & 0 & 1 & 0 & \mathfrak{A} \end{array}$$
$$\begin{array}{ccccccc} \gamma & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \mathfrak{A} & 1 & 0 & 0 & 1 & 0 & \mathfrak{A} \end{array}$$
$$\begin{array}{ccccccc} \gamma & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \mathfrak{A} & 0 & 0 & 0 & 0 & 1 & \mathfrak{A} \end{array}$$
$$\begin{array}{ccccccc} \gamma & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \mathfrak{A} & 0 & 1 & 0 & 0 & 1 & 0 \mathfrak{A} \end{array}$$
$$\begin{array}{ccccccc} \gamma & & & & & & \Delta \\ \delta & \underbrace{\quad\quad}_{1} & \rightsquigarrow & \rightsquigarrow & \text{---} & \text{=} & \rightsquigarrow \delta \end{array}$$

γ
 δ

0 1 0 0 0 1 0

Δ
 δ

	
1	0

Plagal Fourth Mode - Heirmologic

1000010

00010010

00100010

0001000010

From Vou

10	$\begin{array}{c} \overset{6}{\gamma_\lambda} \quad \overset{\Delta}{d_\lambda} \\ \hline 1 \quad 0 \end{array}$	
	$\begin{array}{c} \overset{6}{\gamma_\lambda} \quad \overset{\Delta}{d_\lambda} \\ \hline 1 \quad 0 \end{array}$	
	$\begin{array}{c} \overset{6}{\gamma_\lambda} \quad \overset{\Delta}{d_\lambda} \\ \hline 1 \quad 0 \end{array}$	
010	$\begin{array}{c} \overset{6}{\gamma_\lambda} \quad \overset{\Delta}{d_\lambda} \\ \hline 0 \quad 1 \quad 0 \end{array}$	
00010	$\begin{array}{c} \overset{6}{\gamma_\lambda} \quad \overset{\Delta}{d_\lambda} \\ \hline 0 \quad 0 \quad 0 \quad 1 \quad 0 \end{array}$	
10010	$\begin{array}{c} \overset{6}{\gamma_\lambda} \quad \overset{\Delta}{d_\lambda} \\ \hline 1 \quad 0 \quad 0 \quad 1 \quad 0 \end{array}$	
000010	$\begin{array}{c} \overset{6}{\gamma_\lambda} \quad \overset{\Delta}{d_\lambda} \\ \hline 0 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \end{array}$	
010010	$\begin{array}{c} \overset{6}{\gamma_\lambda} \quad \overset{\Delta}{d_\lambda} \\ \hline 0 \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \end{array}$	
	$\begin{array}{c} \overset{6}{\gamma_\lambda} \quad \overset{\Delta}{d_\lambda} \\ \hline 0 \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \end{array}$	

Plagal Fourth Mode - Heirmologic

0100010	$\overset{6}{\lambda} \text{ — } \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\lambda}$ 0 1 0 0 0 1 0
	$\overset{6}{\lambda} \text{ — } \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\lambda}$ 0 1 0 0 0 1 0
10100010	$\overset{6}{\lambda} \text{ — } \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \overset{\Delta}{\lambda}$ 1 0 1 0 0 0 1 0

From Di

10	$\overset{\Delta}{\lambda} \text{ — } \text{—} \text{—} \text{—} \overset{\Delta}{\lambda}$ 1 0	$\text{—} \text{—} \text{—} \text{—}$ 1
	$\overset{\Delta}{\lambda} \text{ — } \text{—} \text{—} \text{—} \overset{\Delta}{\lambda}$ 1 0	$\text{—} \text{—} \text{—} \text{—}$ 0
	$\overset{\Delta}{\lambda} \text{ — } \text{—} \text{—} \text{—} \overset{\Delta}{\lambda}$ 1 0	
010	$\overset{\Delta}{\lambda} \text{ — } \text{—} \text{—} \text{—} \overset{\Delta}{\lambda}$ 0 1 0	
	$\overset{\Delta}{\lambda} \text{ — } \text{—} \text{—} \text{—} \overset{\Delta}{\lambda}$ 0 1 0	$\text{—} \text{—} \text{—} \text{—}$ 0
0010	$\overset{\Delta}{\lambda} \text{ — } \text{—} \text{—} \text{—} \overset{\Delta}{\lambda}$ 0 0 1 0	$\text{—} \text{—} \text{—} \text{—}$ 1
	$\overset{\Delta}{\lambda} \text{ — } \text{—} \text{—} \text{—} \overset{\Delta}{\lambda}$ 0 0 1 0	
	$\overset{\Delta}{\lambda} \text{ — } \text{—} \text{—} \text{—} \overset{\Delta}{\lambda}$ 0 0 1 0	
00010	$\overset{\Delta}{\lambda} \text{ — } \text{—} \text{—} \text{—} \overset{\Delta}{\lambda}$ 0 0 0 1 0	$\text{—} \text{—} \text{—} \text{—}$ 1

Plagal Fourth Mode - Heirmologic

10010		
000010		
X00010		
010010		
100010		
0100010		
0X00010		

Plagal Fourth Mode - Heirmologic

1000010		
1100010		
00010010		
10000010		
10X00010		
11000010		
101000010		
0001100010		

Accented on third to last syllable:

From Nee

100	

Plagal Fourth Mode - Heirmologic

$$\begin{array}{ccccccc} \nu & & & & & & \Delta \\ \text{♩} & \text{♩} & \text{♩} & \text{♩} & \text{♩} & \text{♩} & \text{♩} \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 \end{array}$$
$$\begin{array}{ccccccc} \gamma & & \Gamma & & & & \Delta \\ \mathfrak{A} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \mathfrak{A} \\ & 1 & & & 0 & 0 & \end{array}$$
[illegible]
$$\frac{1}{1}$$
[illegible]
$$\begin{array}{ccccccc} \gamma & & & & & & \Delta \\ \mathfrak{A} & \text{---} & \text{---} & \text{---} & \text{---} & & \mathfrak{A} \\ & 0 & 1 & 0 & 0 & & \end{array}$$

0100

1

$$\begin{array}{c} \gamma \\ \delta \end{array} \frac{1}{0} \frac{1}{1} \frac{1}{0} \frac{1}{0} \begin{array}{c} \Delta \\ \delta \end{array}$$
$$\gamma_{\mathfrak{A}} \frac{1}{0} \frac{1}{1} \frac{1}{0} \frac{1}{0} \Delta_{\mathfrak{A}}$$
$$\mathfrak{A} \xrightarrow{0} \mathfrak{B} \xrightarrow{1} \mathfrak{C} \xrightarrow{0} \mathfrak{D} \xrightarrow{0} \mathfrak{E}$$
$$\begin{array}{ccccccc} \gamma & & & & & & \Delta \\ \partial & \frac{1}{0} & \frac{1}{1} & \frac{1}{0} & \frac{1}{0} & & \partial \end{array}$$
$$\gamma \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \Delta$$

$$\partial \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \quad \partial$$

00100

$$\begin{array}{ccccccc} \gamma & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \mathfrak{A} & 1 & 0 & 1 & 0 & 0 & \mathfrak{A} \end{array}$$

10100

$$\begin{array}{ccccccc} \gamma & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \delta & 0 & 0 & 0 & 1 & 0 & 0 \\ & & & & & & \delta \end{array}$$

000100

$$\begin{array}{ccccccc} \gamma & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \mathfrak{A} & 0 & 0 & 0 & 1 & 0 & \mathfrak{A} \end{array}$$

Plagal Fourth Mode - Heirmologic

	$\begin{array}{c} \nu \\ \delta \end{array} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \begin{array}{c} \Delta \\ \delta \end{array}$ 0 0 0 1 0 0
	$\begin{array}{c} \nu \\ \delta \end{array} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \begin{array}{c} \Delta \\ \delta \end{array}$ 0 0 0 1 0 0
000101	$\begin{array}{c} \nu \\ \delta \end{array} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \begin{array}{c} \Delta \\ \delta \end{array}$ 0 0 0 1 0 1
100100	$\begin{array}{c} \nu \\ \delta \end{array} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \begin{array}{c} \Delta \\ \delta \end{array}$ 1 0 0 1 0 0
1000100	$\begin{array}{c} \nu \\ \delta \end{array} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \begin{array}{c} \Delta \\ \delta \end{array}$ 1 0 0 0 1 0 0
01000100	$\begin{array}{c} \nu \\ \delta \end{array} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \begin{array}{c} \Delta \\ \delta \end{array}$ 0 1 0 0 0 1 0 0
0X0100100	$\begin{array}{c} \nu \\ \delta \end{array} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \begin{array}{c} \Delta \\ \delta \end{array}$ 0 X 0 1 0 0 1 0 0
100100100	$\begin{array}{c} \nu \\ \delta \end{array} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \begin{array}{c} \Delta \\ \delta \end{array}$ 1 0 0 1 0 0 1 0 0
101000100	$\begin{array}{c} \nu \\ \delta \end{array} \begin{array}{c} \text{—} \text{—} \text{—} \text{—} \text{—} \text{—} \end{array} \begin{array}{c} \Delta \\ \delta \end{array}$ 1 0 1 0 0 0 1 0 0

From Vou

100	$\begin{array}{c} \epsilon \\ \lambda \end{array} \begin{array}{c} \text{—} \text{—} \text{—} \end{array} \begin{array}{c} \Delta \\ \delta \end{array}$ 1 0 0
	$\begin{array}{c} \epsilon \\ \lambda \end{array} \begin{array}{c} \text{—} \text{—} \text{—} \end{array} \begin{array}{c} \Delta \\ \delta \end{array}$ 1 0 0
0100	$\begin{array}{c} \epsilon \\ \lambda \end{array} \begin{array}{c} \text{—} \text{—} \text{—} \end{array} \begin{array}{c} \Delta \\ \delta \end{array}$ 0 1 0 0
00100	$\begin{array}{c} \epsilon \\ \lambda \end{array} \begin{array}{c} \text{—} \text{—} \text{—} \end{array} \begin{array}{c} \Delta \\ \delta \end{array}$ 0 0 1 0 0

Plagal Fourth Mode - Heirmologic

000100 $\begin{array}{c} \overset{6}{\lambda} \text{ — — — — — } \overset{\Delta}{\lambda} \\ 0 \ 0 \ 0 \ 1 \ 0 \ 0 \end{array}$ $\begin{array}{c} \text{ — — — } \\ 1 \ 0 \ 0 \end{array}$

0100100 $\begin{array}{c} \overset{6}{\lambda} \text{ — — — — — } \overset{\Delta}{\lambda} \\ 0 \ 1 \ 0 \ 0 \ 1 \ 0 \ 0 \end{array}$

From Di

100 $\begin{array}{c} \overset{\Delta}{\lambda} \text{ — — — } \overset{\Delta}{\lambda} \\ 1 \ 0 \ 0 \end{array}$

$\begin{array}{c} \overset{\Delta}{\lambda} \text{ — — — } \overset{\Delta}{\lambda} \\ 1 \ 0 \ 0 \end{array}$

$\begin{array}{c} \overset{\Delta}{\lambda} \text{ — — — } \overset{\Delta}{\lambda} \\ 1 \ 0 \ 0 \end{array}$

$\begin{array}{c} \overset{\Delta}{\lambda} \text{ — — — } \overset{\Delta}{\lambda} \\ 1 \ 0 \ 0 \end{array}$

$\begin{array}{c} \overset{\Delta}{\lambda} \text{ — — — } \overset{\Delta}{\lambda} \\ 1 \ 0 \ 0 \end{array}$

$\begin{array}{c} \overset{\Delta}{\lambda} \text{ — — — } \overset{\Delta}{\lambda} \\ 1 \ 0 \ 0 \end{array}$

101 $\begin{array}{c} \overset{\Delta}{\lambda} \text{ — — — } \overset{\Delta}{\lambda} \\ 1 \ 0 \ 1 \end{array}$

$\begin{array}{c} \overset{\Delta}{\lambda} \text{ — — — } \overset{\Delta}{\lambda} \\ 1 \ 0 \ 1 \end{array}$

0100 $\begin{array}{c} \overset{\Delta}{\lambda} \text{ — — — } \overset{\Delta}{\lambda} \\ 0 \ 1 \ 0 \ 0 \end{array}$

$\begin{array}{c} \overset{\Delta}{\lambda} \text{ — — — } \overset{\Delta}{\lambda} \\ 0 \ 1 \ 0 \ 0 \end{array}$

$\begin{array}{c} \overset{\Delta}{\lambda} \text{ — — — } \overset{\Delta}{\lambda} \\ 0 \ 1 \ 0 \ 0 \end{array}$

Plagal Fourth Mode - Heirmologic

10100	
000100	
000101	
010100	
100100	
110100	



Plagal Fourth Mode - Heirmologic

1000100

$$\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}} \quad 1 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \quad \overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$$
$$\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}} \quad \begin{array}{ccccccc} \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & \text{---} & \curvearrowright & \curvearrowright \\ 1 & 0 & 0 & 0 & 1 & 0 & 0 \end{array} \quad \overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$$

0100100

$$\overset{\Delta}{\mathfrak{A}} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{\Delta}{\mathfrak{A}}$$

01000100

$$\overset{\Delta}{\mathfrak{A}} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \text{---} \overset{\Delta}{\mathfrak{A}}$$

0 1 0 0 0 1 0 0

$$\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \text{---} \quad \overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$$

0 1 0 00 1 00

10010100

0100000100

$$\overset{\Delta}{\mathfrak{A}} \curvearrowright 0 \curvearrowright 1 \curvearrowright 0 \curvearrowright 0 \curvearrowright 0 \curvearrowright 0 \curvearrowright 1 \curvearrowright 0 \curvearrowright 0 \overset{\Delta}{\mathfrak{A}}$$

Accented on fourth to last syllable:

From Nee

1001

γ
 α

1 0 0 1

Δ
 α

1

1

Plagal Fourth Mode - Heirmologic

1010

$\begin{matrix} v & & \text{A} \\ \text{A} & 1 & 0 & 1 & 0 & \text{A} \end{matrix}$

$\begin{matrix} v & & \text{A} \\ \text{A} & 1 & 0 & 1 & 0 & \text{A} \end{matrix}$

01001

$\begin{matrix} v & & \text{A} \\ \text{A} & 0 & 1 & 0 & 0 & 1 & \text{A} \end{matrix}$

$\begin{matrix} v & & \text{A} \\ \text{A} & 0 & 1 & 0 & 0 & 1 & \text{A} \end{matrix}$

01010

$\begin{matrix} v & & \text{A} \\ \text{A} & 0 & 1 & 0 & 1 & 0 & \text{A} \end{matrix}$

$\begin{matrix} v & & \text{A} \\ \text{A} & 0 & 1 & 0 & 1 & 0 & \text{A} \end{matrix}$

$\begin{matrix} v & & \text{A} \\ \text{A} & 0 & 0 & 1 & 0 & 1 & 0 & \text{A} \end{matrix}$

01100

$\begin{matrix} v & & \text{A} \\ \text{A} & 0 & 1 & 1 & 0 & 0 & \text{A} \end{matrix}$

001001

$\begin{matrix} v & & \text{A} \\ \text{A} & 0 & 0 & 1 & 0 & 0 & 1 & \text{A} \end{matrix}$

0001001

$\begin{matrix} v & & \text{A} \\ \text{A} & 0 & 0 & 0 & 1 & 0 & 0 & 1 & \text{A} \end{matrix}$

$\begin{matrix} v & & \text{A} \\ \text{A} & 1 & 0 & \end{matrix}$

$\begin{matrix} v & & \text{A} \\ \text{A} & 0 & 0 & 0 & 1 & 0 & 0 & 1 & \text{A} \end{matrix}$

$\begin{matrix} v & & \text{A} \\ \text{A} & 0 & 0 & 0 & 1 & 0 & 0 & 1 & \text{A} \end{matrix}$

$\begin{matrix} v & & \text{A} \\ \text{A} & 1 & \end{matrix}$

00101010

$\begin{matrix} v & & \text{A} \\ \text{A} & 0 & 0 & 1 & 0 & 1 & 0 & 1 & 0 & \text{A} \end{matrix}$

From Vou

Plagal Fourth Mode - Heirmologic

01001

$\overset{6}{\chi}$ 0 1 0 0 1 $\overset{\Delta}{\mathfrak{A}}$

1

0001001

λ 0 0 0 1 0 0 1 Δ

1

$$\begin{array}{ccccccc} \overset{6}{\lambda} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} \\ 0 & 0 & 0 & 1 & 0 & 0 & 1 \end{array}$$

01000001001

Diagram illustrating a sequence of bits (01000001001) with associated symbols and markings above and below the sequence.

From Di

1001

$\overset{\Delta}{\mathfrak{A}} \quad \overset{\Delta}{\mathfrak{A}} \quad \overset{\Delta}{\mathfrak{A}} \quad \overset{\Delta}{\mathfrak{A}} \quad \overset{\Delta}{\mathfrak{A}}$

1 0 0 1

1010 𐤀𐤍𐤁𐤁𐤀

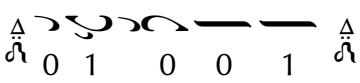
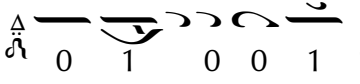
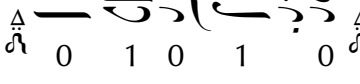
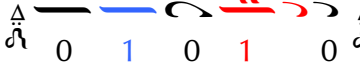

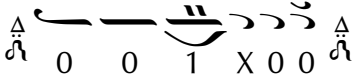
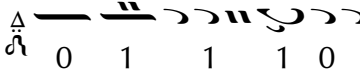
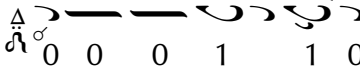
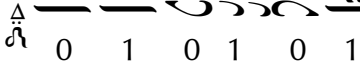
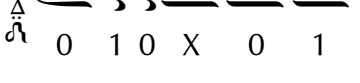

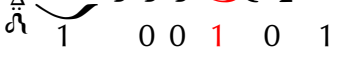
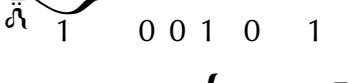
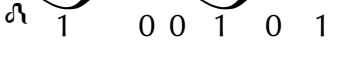
01000

Δ — — — — Δ
 0 1 0 0 0

01001

$$\begin{array}{ccccccccc} \Delta & & & & & & & & \Delta \\ \downarrow & & & & & & & & \downarrow \\ \mathfrak{A} & 0 & 1 & 0 & 0 & 1 & \mathfrak{A} \end{array}$$
$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ \text{---} & & & & & & \text{---} \\ 0 & 1 & 0 & 0 & 1 & & \end{array}$$
$$\overset{\Delta}{\underset{\Delta}{\mathfrak{A}}} \quad \text{0} \quad \text{1} \quad \text{0} \quad \text{0} \quad \text{1} \quad \overset{\Delta}{\underset{\Delta}{\mathfrak{A}}}$$
$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \frac{\Gamma}{\text{---}} & \text{---} & \text{---} & \Delta \\ \text{---} & & & & & & \text{---} \\ 0 & 1 & & & 0 & 0 & 1 \end{array}$$

Plagal Fourth Mode - Heirmologic

	
	
01010	
	
	
001X00	
011100	
0001100	
0101010	
010X010	
1001001	
1001010	
	
	

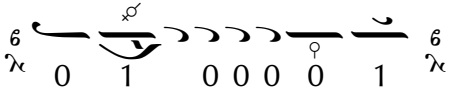

1 0 0

1

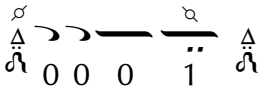
D) Formulae with Fthores

Accented on last syllable:

From Vou

0100001 

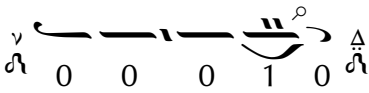
From Di

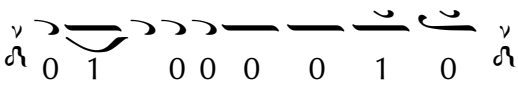
0001 

10001 


Accented on second to last syllable:

From Nee

00010 

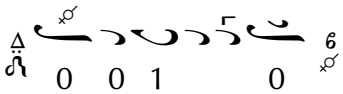
01000010 

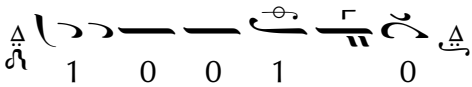
From Vou

10010 

From Di

10 

0010 

10010 

Plagal Fourth Mode - Heirmologic

0100010

01000010

Δ_{in}

0 1 0 0 0 1 0

Δ_{out}

Accented on third to last syllable:

From Nee

00100

From Vou

$$0100 \quad \begin{array}{ccccccc} & & & \textcircled{\times} & & & \\ & & & \text{---} & & & \\ \textcircled{\times} & \text{---} & & \text{---} & \text{---} & & \textcircled{\times} \\ & 0 & 1 & 0 & 0 & & \end{array}$$
$$1000100 \quad \begin{array}{ccccccc} & \textcircled{\times} & & & & & \textcircled{\times} \\ \textcircled{\gamma} & \textcircled{\text{---}} & \textcircled{\text{---}} & \textcircled{\text{---}} & \textcircled{\text{---}} & \textcircled{\text{---}} & \textcircled{\text{---}} \\ 1 & 0 & 0 & 0 & 1 & 0 & 0 \end{array}$$
$$\begin{array}{ccccccc} \overline{\cup} & \textcircled{\cap} & \text{---} & \text{---} & \overline{\cap} & \textcircled{\cap} & \Delta \\ {}^6\lambda & 1 & 0 & 0 & 0 & 1 & 0 & 0 \end{array}$$

From Di

00100

[illegible]

Accented on fourth to last syllable:

From Nee

[illegible]

From Vou

Plagal Fourth Mode - Heirmologic

00001001 $\overset{6}{\gamma} \curvearrowright \text{---} \text{---} \text{---} \text{---} \text{---} \curvearrowleft \text{---} \text{---} \text{---} \overset{\gamma}{\delta}$
 0 0 0 0 1 0 0 1


From Di

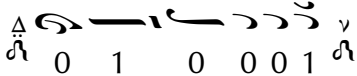
0001001 $\overset{\Delta}{\delta} \text{---} \text{---} \text{---} \text{---} \text{---} \curvearrowleft \text{---} \text{---} \text{---} \overset{\gamma}{\delta}$
 0 0 0 1 0 0 1

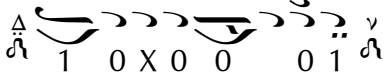
E) Ending Formulae

(Formulae from Di to Nee in section A may also be used here.)

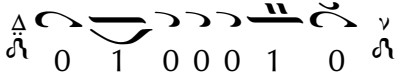
Accented on last syllable:

010001 





10X0001 


Accented on second to last syllable:


0100010 


Accented on third to last syllable:


000100 





100100 





Plagal Fourth Mode - Heirmologic

1000100

01000100

Accented on fourth to last syllable:

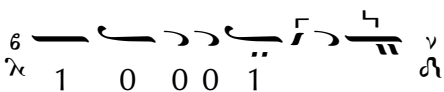
(Use a medial cadence from Di to Nee at the end of section A)

F) Endings for Theotokia*

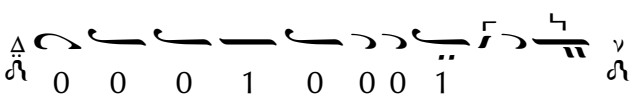
Accented on last syllable:

(A formula ending in 100 or 1001 may also be used here.)

From Vou

10001 

From Di

00010001 

Accented on second to last syllable:

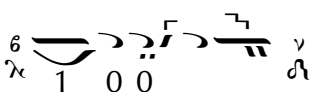
From Di


10010 

100010 

Accented on third to last syllable:

From Vou

100 

0100100 

01000100 

* The formulae in blue in this section are from the Athonite oral tradition, as represented in the book *Παρακλητική, Μουσικὸν Ἐγκόλπιον, Πλάγιοι Ἦχοι, Ἱεροθέου Ἱερομονάχου*, ἐκδόσεις Ἱ.Μ. Φιλοθέου, Ἁγίου Ὄρους, 2004.

Plagal Fourth Mode - Heirmologic

From Di

000100

100100

1000100

1000100

1000100

0 1

Accented on fourth to last syllable:

From Vou

1001

1001

From Di

X01001

X01001

BYZANTINE MUSIC FORMULÆ

Plagal Fourth Mode - Heirmologic (Triphonos) Apolytikia

Contents*

A) Medial Cadences on Ga.....	939
B) Medial Cadences on Di.....	943
C) Endings for Theotokia.....	951

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

* The Byzantine music formulae herein were extracted from heirmologic melodies found in the *Zoe Anastasimatarion* (14th edition, 2002), the *Neon Anastasimatarion* by Petros Ephesios (1820 edition), the first volume of *Mousike Kypsele* (1883 edition), and the *Parakletikes Mousikon Engolpion*, by Hieromonk Hierotheos of Philotheou Monastery (2003 edition). Note that these formulae are applicable only to apolytikia, kontakia, and some kathismata. The compilation at: <http://www.stanthonysmonastery.org/music/Formula8c.pdf> contains formulae in heirmologic triphonos plagal fourth mode that are applicable to the canons.

Plagal Fourth Mode - Heirmologic (Triphonos) - Apolytikia

A) Medial Cadences on Ga

(These are also used as ending formulae)

Accented on last syllable:

From Ga

$$00 \quad \begin{array}{c} \text{r} \\ \text{A} \end{array} \text{---} \text{---} \text{---} \begin{array}{c} \text{r} \\ \text{A} \end{array}$$

10001

$$\begin{array}{ccccccc} \Gamma & \curvearrowright & \curvearrowright & \curvearrowright & \overline{\Gamma} & \curvearrowright & \Gamma \\ \mathfrak{A} & 1 & 0 & 0 & 0 & 1 & \mathfrak{A} \end{array}$$
$$\begin{array}{ccccccc} \Gamma & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Gamma \\ \mathfrak{A} & 1 & 0 & 0 & 0 & 1 & \mathfrak{A} \end{array}$$

From Di

00 Δ γ γ γ

010001

Δ
 q

 0 1 0 0 0_♂ 1 ♀

0010001

Δ
q

0 0 1 0 0 0 1

♂

Accented on second to last syllable:

From Ga

10 $\begin{array}{ccccc} & & \text{r} & \text{u} & \text{r} \\ & & \text{a} & 1 & 0 & \text{a} \end{array}$

10010

$$\begin{array}{ccccccccc} & \text{r} & & & & & & & \\ & \text{---} & & & & & & & \\ & \text{d} & & & & & & & \\ & 1 & & 0 & & 0 & & 1 & & 0 & & \text{d} \end{array}$$

1

Plagal Fourth Mode - Heirmologic (Triphonos) - Apolytikia

1 0 0 1 0

From Di

10010

 1 0 0 1 0

100010

 1 0 0 0 1 0

0100010

 0 1 0 0 0 1 0

0 1 0

0 1 0 0 0 1 0

1000010

 1 0 0 0 0 1 0

1010010

 1 0 1 0 0 1 0

Accented on third to last syllable:

From Ga

100

 1 0 0

1 0 0


1 0 0

1 0 0

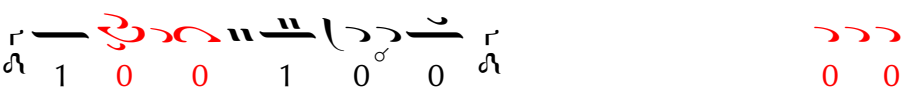
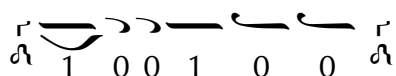
1 0 0

Plagal Fourth Mode - Heirmologic (Triphonos) - Apolytikia

0100

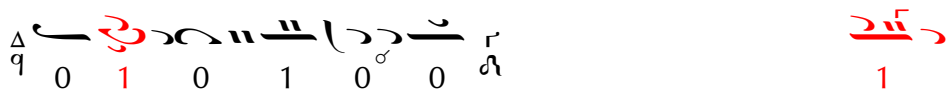
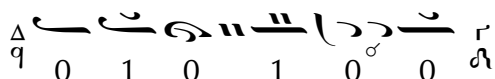


100100

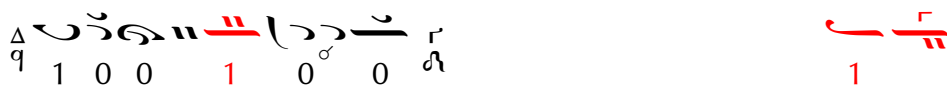



From Di


010100

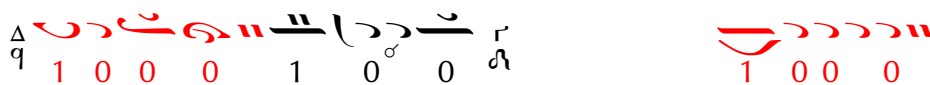
100100



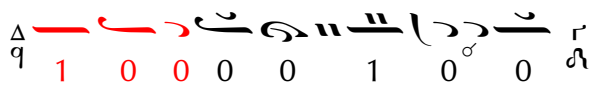
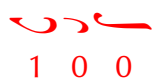
000X100




1000100



10000100

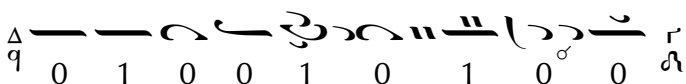




10010100



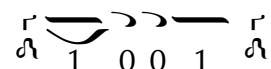

Plagal Fourth Mode - Heirmologic (Triphonos) - Apolytikia

10100100 


010010100 

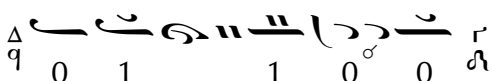
Accented on fourth to last syllable:

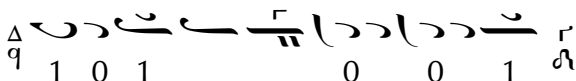
From Ga

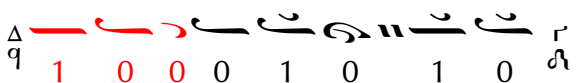

1001 

From Di

1001 

01100 

101001 

10001010  

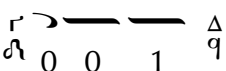
1001001* 

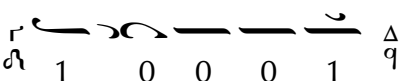
*Note: The above formula in blue was not taken from a publication in Greek but from the 1847 Slavonic Anastasimatarion published in Bucharest. This formula was included because at first it was the only occurrence of a 1001 formula in this mode with a full cadence on Ga that we could find in a nineteenth-century publication with traditional formulae. In August of 2009, however, we found the above 1001 and 101001 formulae from Di to Ga (from Georgios Raidestinos and Ioannis the Lampadarios respectively), which have now been included in this section.

B) Medial Cadences on Di

Accented on last syllable:

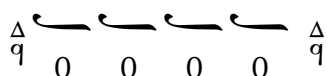
From Ga

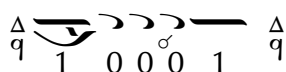
001 

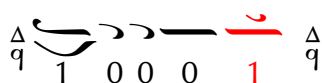
10001 

From Di

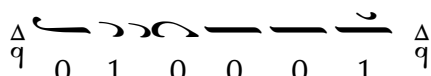
00 

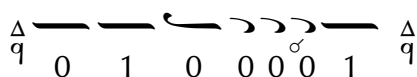
000 

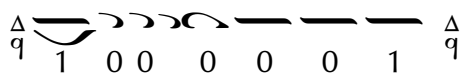
10001 

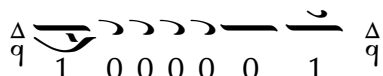




010001 

0100001 

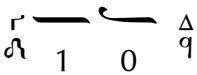
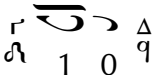
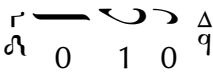
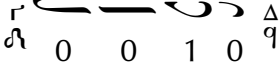
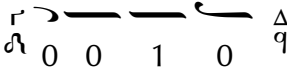
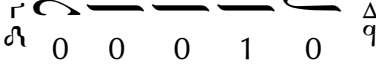
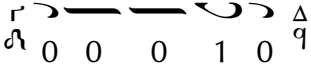
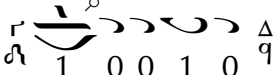
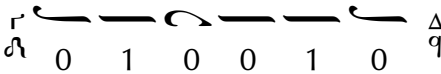
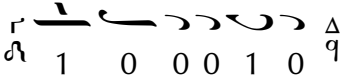
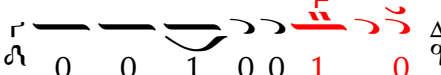

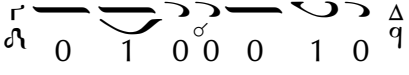
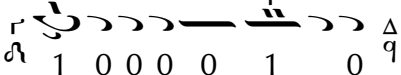
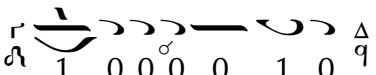
1000001 



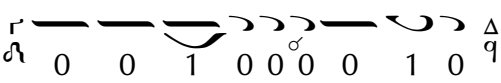
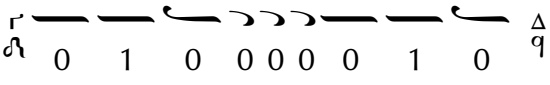
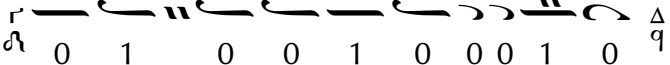
Accented on second to last syllable:

From Ga

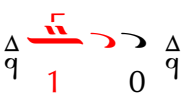

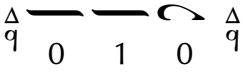
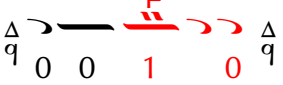

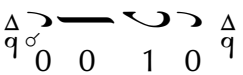
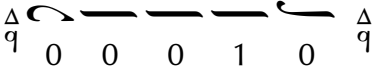
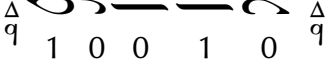
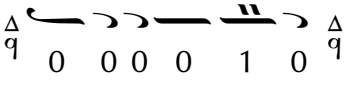
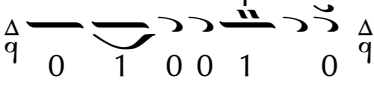
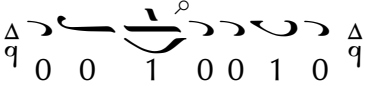
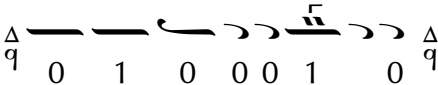
Plagal Fourth Mode - Heirmologic (Triphonos) - Apolytikia

10		
		
010		
0010		
		
00010		
		
10010		
010010		
100010		
0010010		
0100010		
1000010		
		





Plagal Fourth Mode - Heirmologic (Triphonos) - Apolytikia

001000010	
010000010	
0100100010	

From Di






10		
010		
0010		
		
00010		
10010		
000010		
010010		
0010010		
0100010		

Plagal Fourth Mode - Heirmologic (Triphonos) - Apolytikia

1000010	Δ q  0 0 0 0 1 0 Δ q	
01000010	Δ q 0 1 0 0 0 0 1 0 Δ q	
10000010	Δ q  0 0 0 0 0 1 0 Δ q	
10001000010	Δ q  0 0 0 1 0 0 0 0 1 0 Δ q	
000100010010	Δ q 0 0 0 1 0 0 0 1 0 0 1 0 Δ q	

Accented on third to last syllable:

From Ga

100	Δ q  0 0 Δ q	
	Δ q  0 0 Δ q	
0100	Δ q 0 1 0 0 Δ q	
00100	Δ q 0 0 1 0 0 Δ q	
	Δ q 0 0  0 0 Δ q	
000100	Δ q 0 0 0 1 0 0 Δ q	
100100	Δ q  0 0 1 0 1 Δ q	

Plagal Fourth Mode - Heirmologic (Triphonos) - Apolytikia

0100100

0 1 0 0 1 0 0 Δ
 q

0 1 0 0 1 0 0 Δ
 q

0 1 0 0 1 0 0 Δ
 q

0 1 0 0 1 0 0 Δ
 q

1000100

1 0 0 0 1 0 0 Δ
 q

01000100

0 1 0 0 0 1 0 0 Δ
 q

1 0 0

0 1 0 0 0 1 0 0 Δ
 q

0001000100

0 0 0 1 0 0 0 1 0 0 0 Δ
 q

From Di

100

1 0 0 Δ
 q

1 0 0 Δ
 q

1 0

1 0 0 Δ
 q

1 0 0 Δ
 q

0100

0 1 0 0 Δ
 q

Plagal Fourth Mode - Heirmologic (Triphonos) - Apolytikia

$$\Delta_q \begin{array}{c} \circ \\ \hline 0 \end{array} \quad \begin{array}{c} \text{---} \\ \text{---} \end{array} \quad \begin{array}{c} \text{---} \\ \text{---} \end{array} \quad \begin{array}{c} \text{---} \\ \text{---} \end{array} \quad \begin{array}{c} \text{---} \\ \text{---} \end{array} \quad \Delta_q$$
$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ q & 0 & 1 & 0 & 0 & q \end{array}$$
$$\overset{\Delta}{q} \begin{array}{c} \text{---} \text{---} \text{---} \text{---} \\ 0 \quad 1 \quad 0 \quad 0 \end{array} \overset{\Delta}{q}$$
$$\overset{\Delta q}{\curvearrowright} \quad \overset{\Delta q}{\curvearrowright} \quad \overset{\Delta q}{\curvearrowright} \quad \overset{\Delta q}{\curvearrowright} \quad \overset{\Delta q}{\curvearrowright}$$
$$\begin{array}{cccccc} \Delta_q & \text{hook} & \text{line} & \text{line} & \text{cup} & \text{line} & \Delta_q \\ & 0 & 0 & 0 & 1 & 0 & 0 \end{array}$$
$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ q & 0 & 0 & 0 & 1 & 0 & 0 & q \end{array}$$

0 1

$$\overset{\Delta}{q} \quad \overline{\cup} \quad \cup \quad \cup \quad \overline{\cup} \quad \cup \quad \cup \quad \overset{\Delta}{q}$$

1 0 0 1 0 0

$$\Delta_q \text{---} \underset{1}{\text{---}} \overset{\Gamma}{\text{---}} \underset{00}{\text{---}} \underset{1}{\text{---}} \underset{00}{\text{---}} \Delta_q$$
$$\begin{array}{ccccccc} \Delta & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ q & 0 & 0 & 1 & 0 & 1 & 0 & 0 & q \end{array}$$
$$\Delta_q \begin{array}{c} \circ \\ \hline 0 \end{array} \begin{array}{c} \circ \\ \hline 1 \end{array} \begin{array}{c} \circ \\ \hline 0 \end{array} \begin{array}{c} \circ \\ \hline 0 \end{array} \begin{array}{c} \circ \\ \hline 1 \end{array} \begin{array}{c} \circ \\ \hline 0 \end{array} \begin{array}{c} \circ \\ \hline 0 \end{array} \Delta_q$$

$\frac{1}{0}$	$\frac{1}{1}$
---------------	---------------

$$\Delta q \quad \begin{array}{ccccccc} \curvearrowright & \text{---} & \text{---} & \curvearrowright & \curvearrowright & \text{---} & \curvearrowright \\ 0 & 1 & \text{---} & 0 & 0 & 1 & 0 & 0 \end{array} \quad \Delta q$$
$$\Delta_q \begin{array}{c} \text{---} \\ \text{0} \end{array} \text{---} \text{---} \text{---} \overset{\circ}{\curvearrowright} \text{---} \overset{\circ}{\curvearrowleft} \text{---} \text{---} \Delta_q$$
$$\begin{array}{ccccccc} \Delta & \curvearrowright & \text{---} & \text{---} & \text{---} & \text{---} & \Delta \\ q & 0 & 0 & 1 & 0 & 0 & q \end{array}$$

Plagal Fourth Mode - Heirmologic (Triphonos) - Apolytikia

000100100	Δ q 0 0 0 1 0 0 1 0 0 Δ q	Δ q 1 0 0 Δ q
001000100	Δ q 0 0 1 0 0 0 1 0 0 Δ q	
010000100	Δ q 0 1 0 0 0 0 1 0 0 Δ q	
0001000100	Δ q 0 0 0 1 0 0 0 1 0 0 Δ q	

Accented on fourth to last syllable:

From Ga

1000	Δ q 1 0 0 0 Δ q	
01000	Δ q 0 1 0 0 0 Δ q	
001000	Δ q 0 0 1 0 0 0 Δ q	
001001	Δ q 0 0 1 0 0 1 Δ q	
0001001	Δ q 0 0 0 1 0 0 1 Δ q	Δ q 1 Δ q
10001001	Δ q 1 0 0 0 1 0 0 1 Δ q	

From Di

1000	Δ q 1 0 0 0 Δ q
1001	Δ q 1 0 0 1 Δ q

Plagal Fourth Mode - Heirmologic (Triphonos) - Apolytikia

01000	$\overset{\Delta}{q}$	$\overline{\quad}$	$\overline{\quad}$	$\overleftarrow{\quad}$	$\overrightarrow{\quad}$	$\overrightarrow{\quad}$	$\overset{\Delta}{q}$
		0	1	0	0	0	

001000	$\overset{\Delta}{q}$	$\overrightarrow{\quad}$	$\overleftarrow{\quad}$	$\overline{\quad}$	$\overleftarrow{\quad}$	$\overrightarrow{\quad}$	$\overrightarrow{\quad}$	$\overset{\Delta}{q}$
		0	0	1	0	0	0	

C) Endings for Theotokia*

Accented on second to last syllable:

100010		
0X00010		

Accented on third to last syllable:

100100		
100010X		
10X0100		

Accented on fourth to last syllable:

1001	
------	--

* The formulae in blue in this section are from the Athonite oral tradition, as represented in the book *Οκτάηχον Εβδομάριον, Μοναχοῦ Δοσιθέου Κατουνακιώτου, ἐκδόσεις Ἱ.Μ. Ἀγίων Κυπριανῶν καὶ Ἰουστίνης, Ἀττική, 1995.*

BYZANTINE MUSIC FORMULÆ

Plagal Fourth Mode - Heirmologic (Triphonos) *Canons*

Contents^{*}

A) Medial Cadences on Nee	953
B) Medial Cadences on Pa.....	954
C) Cadences on Ga.....	955
D) Medial Cadences on Di	961
E) Medial Cadences on Ke	967
F) Other Formulæ	970

Key:

1 = accented syllable
0 = unaccented syllable
X = syllable that may be either
 accented or unaccented

Variations of the same formula
are indicated in color

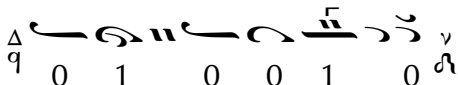
* The Byzantine music formulæ herein were extracted from all the heirmologic melodies found in the Zoe *Anastasimatarion* (14th edition, 2002), the *Heirmologion Katavasion* by Ioannis Protopsaltis (1903 edition), and the *Anastasimatarion* by Petros Peloponnesios (1869 edition). Note that these formulæ are applicable only to the canons. See our compilation at <http://www.stanthonysmonastery.org/music/Formula8t.pdf> for formulæ in heirmologic triphonos plagal fourth mode that are applicable to the apolytikia, kontakia, and kathismata.

Plagal Fourth Mode - Heirmologic (Triphonos) - Canons

A) Medial Cadences on Nee

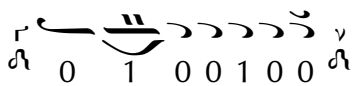
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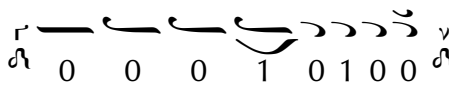
From Di

010010 


Accented on third to last syllable:

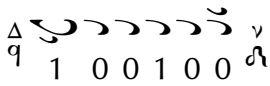
From Ga

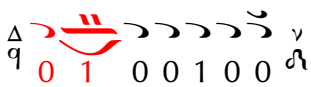
0100100 

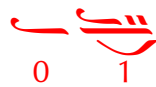
00010100 

From Di

10100 

100100 

0100100 









B) Medial Cadences on Pa





Note: In the nineteenth-century publications on which these formulae are based, cadences on Pa in this mode are almost non-existent. This contrasts sharply with most contemporary oral traditions in which cadences on Pa are frequent.

Accented on second to last syllable:

From Di

0010

Δ q					π q			
0	0	1	0				1	0

Δ q					π q			
0	0	1	0					

C) Cadences on Ga

(These are also used as ending formulae)

Accented on last syllable:

From Nee

0 $\overset{\vee}{\text{A}} \overset{\sim}{\text{0}} \overset{\text{r}}{\text{A}}$

01 $\overset{\vee}{\text{A}} \overset{\sim}{\text{0}} \overset{\sim}{\text{1}} \overset{\text{r}}{\text{A}}$

From Ga

00 $\overset{\text{r}}{\text{A}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\text{r}}{\text{A}}$

01 $\overset{\text{r}}{\text{A}} \overset{\sim}{\text{0}} \overset{\sim}{\text{1}} \overset{\text{r}}{\text{A}}$

$\overset{\text{r}}{\text{A}} \overset{\sim}{\text{0}} \overset{\sim}{\text{1}} \overset{\text{r}}{\text{A}}$

00100001 $\overset{\text{r}}{\text{A}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{1}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{1}} \overset{\text{r}}{\text{A}}$

0000100001 $\overset{\text{r}}{\text{A}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{1}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{1}} \overset{\text{r}}{\text{A}}$

1000100001 $\overset{\text{r}}{\text{A}} \overset{\sim}{\text{1}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{1}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{1}} \overset{\text{r}}{\text{A}}$

$\overset{\text{r}}{\text{A}} \overset{\sim}{\text{1}}$

From Di

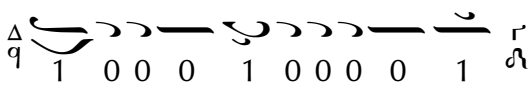
00 $\overset{\Delta}{\text{q}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\text{r}}{\text{A}}$

10001 $\overset{\Delta}{\text{q}} \overset{\sim}{\text{1}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{1}} \overset{\text{r}}{\text{A}}$

0000100001 $\overset{\Delta}{\text{q}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{1}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{0}} \overset{\sim}{\text{1}} \overset{\text{r}}{\text{A}}$

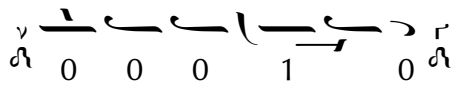
$\overset{\text{r}}{\text{A}} \overset{\sim}{\text{1}}$

Plagal Fourth Mode - Heirmologic (Triphonos) - Canons

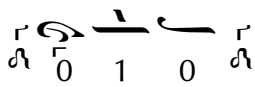
1000100001 

Accented on second to last syllable:

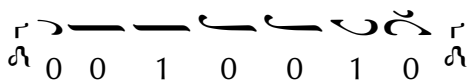
From Nee

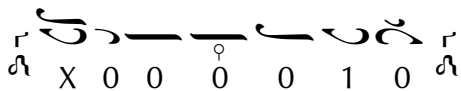
00010 

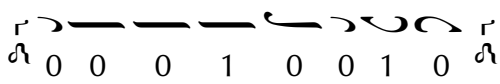
From Ga

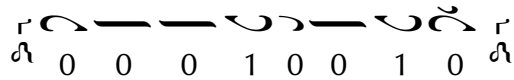
010 

100010 

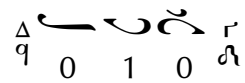
0010010 

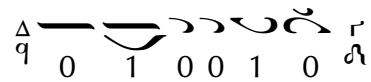
X000010 

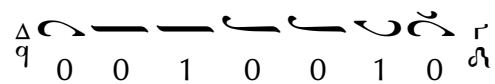
00010010 



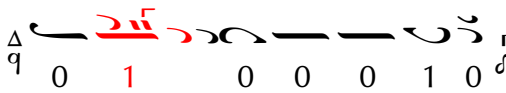

From Di


010 

010010 

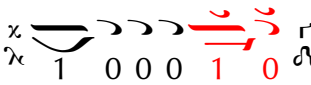

0010010 

Plagal Fourth Mode - Heirmologic (Triphonos) - Canons

0100010  

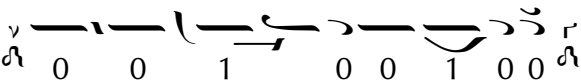
00010010 

From Ke


100010  

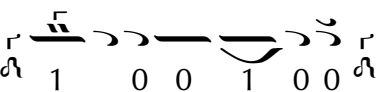
Accented on third to last syllable:

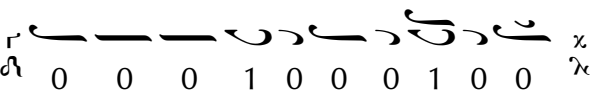
From Nee

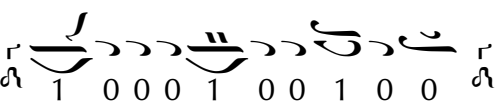
00100100 

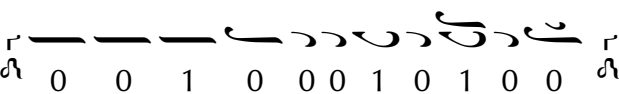
From Ga

0100 


100100 

0001000100 

1000100100 

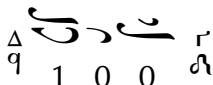
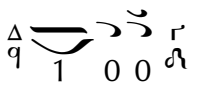


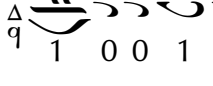
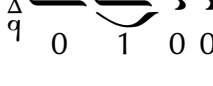
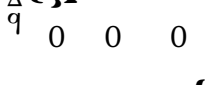

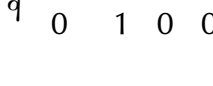
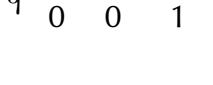
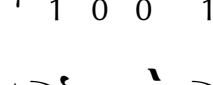
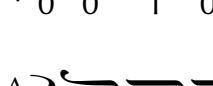


00100010100 

00100100100 

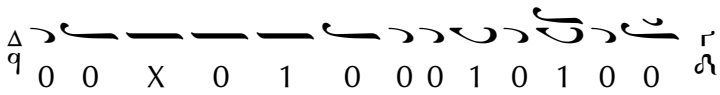
0X0100100100 

From Di

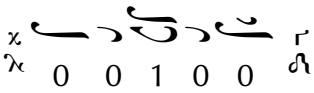
Plagal Fourth Mode - Heirmologic (Triphonos) - Canons


100	Δ q 
	1 0 0
	Δ q 
	1 0 0
0100	Δ q 
	0 1 0 0
10100	Δ q 
	1 0 1 0 0
100100	Δ q 
	1 0 0 1 0 0
0100100	Δ q 
	0 1 0 0 1 0 0
00010100	Δ q 
	0 0 0 1 0 1 0 0
00100100	Δ q 
	0 0 1 0 0 1 0 0
01000100	Δ q 
	0 1 0 0 0 1 0 0
0010X0100	Δ q 
	0 0 1 0 X 0 1 0 0
100100100	Δ q 
	1 0 0 1 0 0 1 0 0
00100100100	Δ q 
	0 0 1 0 0 1 0 0 1 0 0
00X01000100	Δ q 
	0 0 X 0 1 0 0 0 1 0 0
10000100100	Δ q 
	1 0 0 0 0 1 0 0 1 0 0


Plagal Fourth Mode - Heirmologic (Triphonos) - Canons

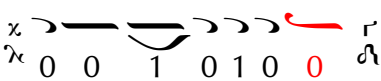
00X0100010100 

From Ke


00100 


010100 

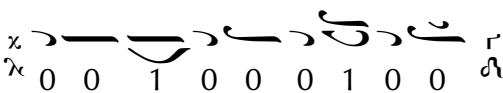
100100 

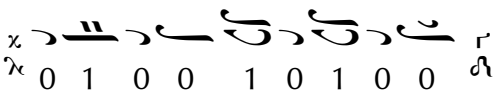
0010100 



0100100 

00010X00 

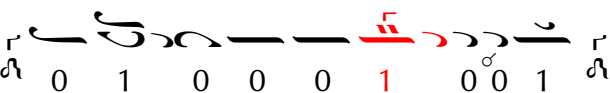
001000100 

010010100 

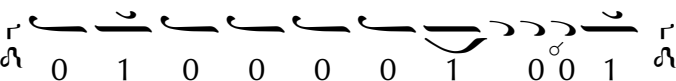
100100100 

Accented on fourth to last syllable:

From Ga

010001001 



0100001001 

Plagal Fourth Mode - Heirmologic (Triphonos) - Canons

From Di

1001	$\Delta \begin{array}{c} \overline{\curvearrowright} \curvearrowright \curvearrowright \overline{\curvearrowright} \\ q \\ 1 \quad 0 \quad 0 \quad 1 \end{array} \begin{array}{c} \overline{\curvearrowright} \\ \delta \end{array}$
01001	$\Delta \begin{array}{c} \overline{\curvearrowright} \overline{\curvearrowright} \curvearrowright \curvearrowright \overline{\curvearrowright} \\ q \\ 0 \quad 1 \quad 0 \quad 0 \quad 1 \end{array} \begin{array}{c} \overline{\curvearrowright} \\ \delta \end{array}$
001001	$\Delta \begin{array}{c} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \curvearrowright \curvearrowright \overline{\curvearrowright} \\ q \\ 0 \quad 0 \quad 1 \quad 0 \quad 0 \quad 1 \end{array} \begin{array}{c} \overline{\curvearrowright} \\ \delta \end{array}$
0001001	$\Delta \begin{array}{c} \curvearrowright \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \curvearrowright \overline{\curvearrowright} \\ q \\ 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \quad 1 \end{array} \begin{array}{c} \overline{\curvearrowright} \\ \delta \end{array}$
0001100	$\Delta \begin{array}{c} \curvearrowright \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \curvearrowright \curvearrowright \\ q \\ 0 \quad 0 \quad 0 \quad 1 \quad 1 \quad 0 \quad 0 \end{array} \begin{array}{c} \overline{\curvearrowright} \\ \delta \end{array}$
100001100	$\Delta \begin{array}{c} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \curvearrowright \curvearrowright \overline{\curvearrowright} \\ q \\ 1 \quad 0 \quad 0 \quad 0 \quad 0 \quad 1 \quad 1 \quad 0 \quad 0 \end{array} \begin{array}{c} \overline{\curvearrowright} \\ \delta \end{array}$

$\overline{\curvearrowright}$
1

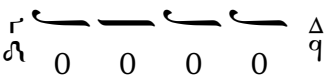
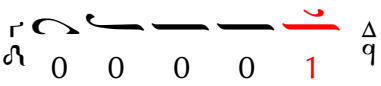

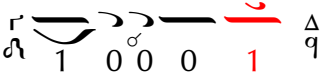

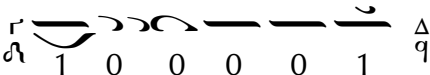

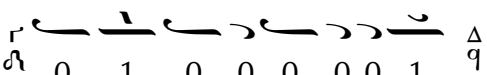
From Ke

01001	$\chi \begin{array}{c} \overline{\curvearrowright} \curvearrowright \curvearrowright \overline{\curvearrowright} \\ \chi \\ 0 \quad 1 \quad 0 \quad 0 \quad 1 \end{array} \begin{array}{c} \overline{\curvearrowright} \\ \delta \end{array}$
000100001001	$\chi \begin{array}{c} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \overline{\curvearrowright} \\ \chi \\ 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0 \quad 1 \end{array} \begin{array}{c} \overline{\curvearrowright} \\ \delta \end{array}$

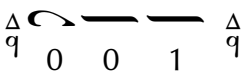
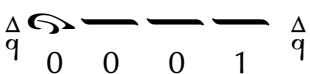
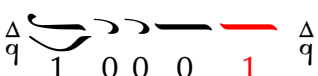

D) Medial Cadences on Di

Accented on last syllable:

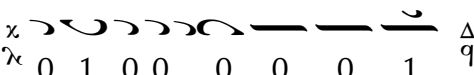
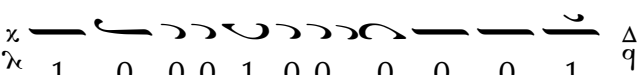
From Ga

0000		
00001		
10001		
100001		
00010001		
01000001		

From Di

001		
0001		
10001		

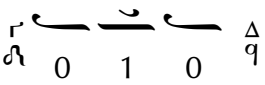
From Ke

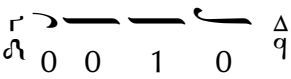
01000001		
10001000001		

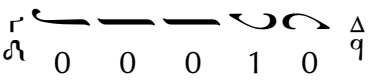
Plagal Fourth Mode - Heirmologic (Triphonos) - Canons

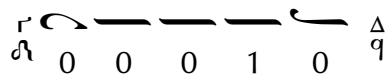
Accented on second to last syllable:

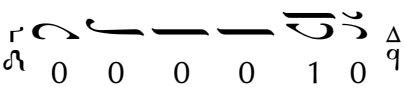
From Ga

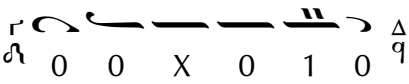
010 


0010 

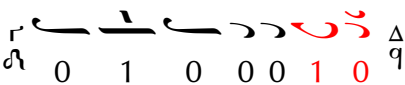
00010 



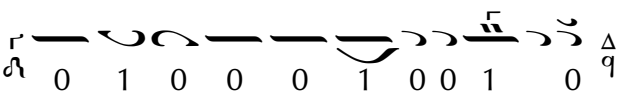
000010 

00X010 

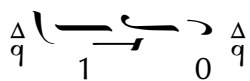
0010010 

0100010 

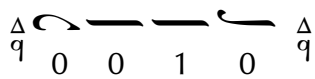


0100010010 

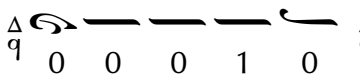
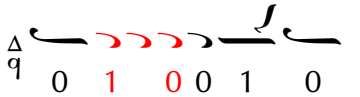

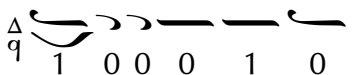
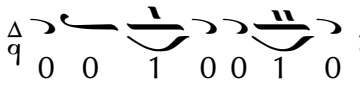
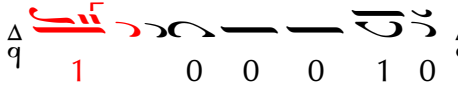

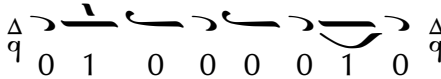
From Di

10 

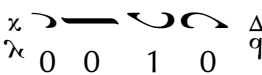
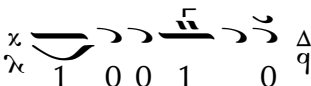



0010 

Plagal Fourth Mode - Heirmologic (Triphonos) - Canons

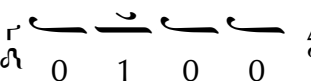
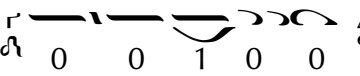
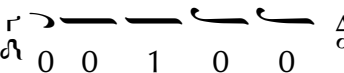
00010	Δ q  Δ q	
010010	Δ q  Δ q	 1 0
100010	Δ q  Δ q	
0010010	Δ q  Δ q	
0100010	Δ q  Δ q	 1
01000010	Δ q  Δ q	

From Ke

0010	χ χ  Δ q
10010	χ χ  Δ q
0010010	χ χ  Δ q

Accented on third to last syllable:

From Ga

0100	Γ δ  Δ q
00100	Γ δ  Δ q
	Γ δ  Δ q

Plagal Fourth Mode - Heirmologic (Triphonos) - Canons

0X0100		
100100		
0010100		
0100100		
00010100		
0100100100		

From Di

100	
0100	
00100	

Plagal Fourth Mode - Heirmologic (Triphonos) - Canons

000100	Δ q 0 0 0 1 0 0 q	
000100	Δ q 0 0 0 1 0 0 q	
0100100	Δ q 0 1 0 0 1 0 0 q	Δ q 1 0
	Δ q 0 1 0 0 1 0 0 q	Δ q 0 1
1000100	Δ q 1 0 0 0 1 0 0 q	

From Ke

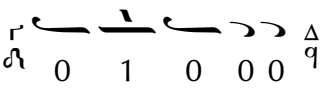
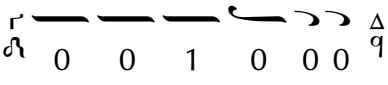
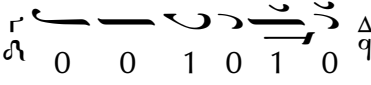
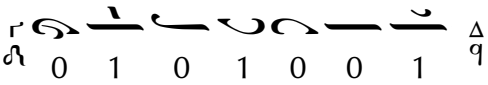
100	Δ q 1 0 0 q	
00100	Δ q 0 0 1 0 0 q	
000100	Δ q 0 0 0 1 0 0 q	
0010100	Δ q 0 0 1 0 1 0 0 q	
00100100	Δ q 0 0 1 0 0 1 0 0 q	Δ q 1 0 0
001000100	Δ q 0 0 1 0 0 0 1 0 0 q	

Accented on fourth to last syllable:

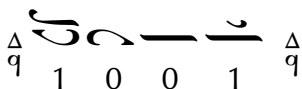
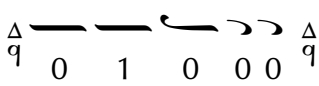
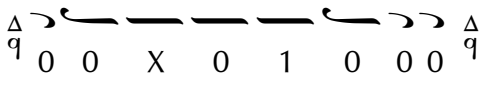
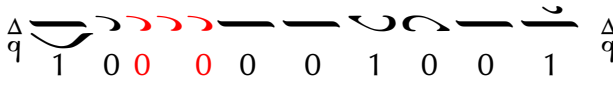

From Ga

1001	Δ q 1 0 0 1 q	Δ q 1
------	-------------------------	-----------------

Plagal Fourth Mode - Heirmologic (Triphonos) - Canons

01000	
001000	
001010	
0101001	

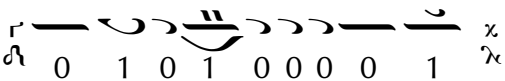
From Di


1001		
01000		
00X01000		
1000001001		

E) Medial Cadences on Ke

Accented on last syllable:

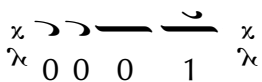
From Ga

010100001 

00010100001 

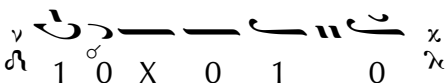
From Ke

00 

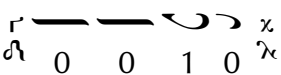
0001 

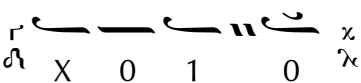
Accented on second to last syllable:

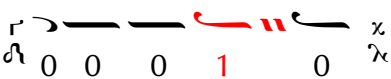
From Nee

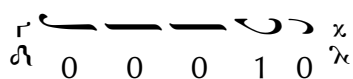
10X010 

From Ga

0010 

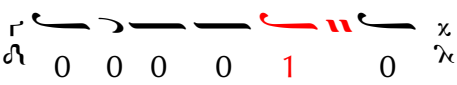

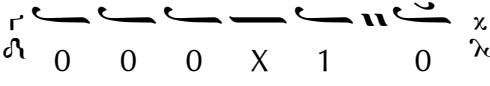
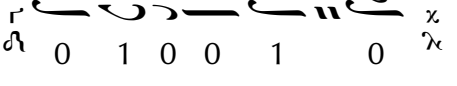
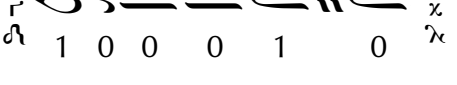
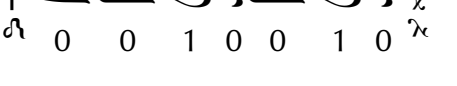
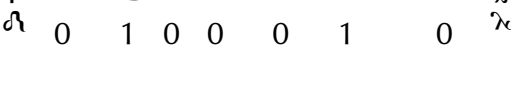
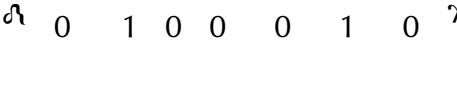
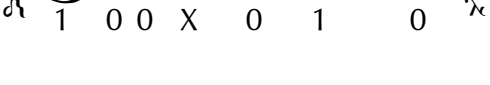
X010 

00010 

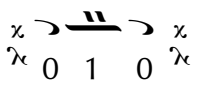
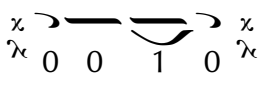
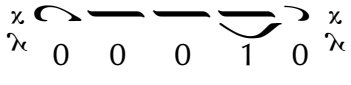





Plagal Fourth Mode - Heirmologic (Triphonos) - Canons

000010		
000X10		
010010		
100010		
0010010		
0100010		
		
100X010		

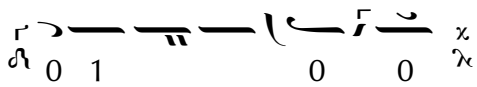
From Ke

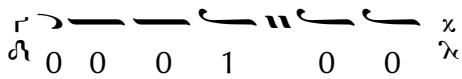
010	
0010	
00010	
00010010	

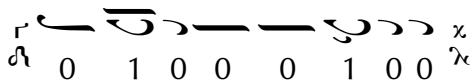
Accented on third to last syllable:

From Ga

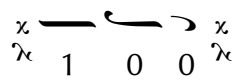
Plagal Fourth Mode - Heirmologic (Triphonos) - Canons

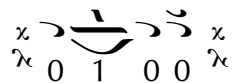
0100 

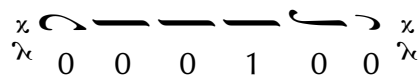
000100 

01000100 

From Ke

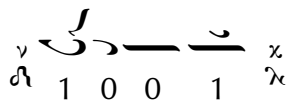
100 

0100 

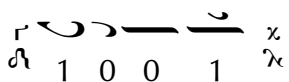
000100 


Accented on fourth to last syllable:

From Nee

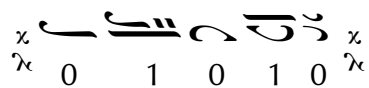
1001 

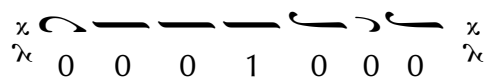
From Ga

1001 

01010 

From Ke

01010 

0001000 

F) Other Formulae

0001001 $\overset{\gamma}{\delta} \quad \overset{\gamma}{\delta} \quad \overset{\gamma}{\delta} \quad \overset{\gamma}{\delta} \quad \overset{\gamma}{\delta} \quad \overset{\gamma}{\delta} \quad \overset{\gamma}{\delta} \quad \overset{\gamma}{\delta}$



Γιὰ ὅσους ἀγνοοῦν τὴν ὀρολογία στὰ ἀγγλικά πού χρησιμοποιεῖται σὲ αὐτὴν τὴν συλλογή, παραθέτουμε τὸ ἐξῆς ἀπλὸ γλωσσάρι πού περιέχει τὶς σημαντικότερες λέξεις.

accented	τονισμένος
apolytikia	ἀπολυτίκια
bridge	γέφυρα
cadence	κατάληξις
canon	κανών
contents	περιεχόμενα
diatonic	διατονικός
ending	καταληκτικός
enharmonic	ἐναρμόνιος
fifth to last syllable	πέμπτη συλλαβὴ ἀπὸ τὸ τέλος
final	ἐντελής
first	πρῶτος
following	ἐπόμενος
formula, formulae	θέσις, θέσεις
fourth to last syllable	τέταρτη συλλαβὴ ἀπὸ τὸ τέλος
fourth	τέταρτος
from	ἀπὸ
fthora	φθορά
grave	βαρὺς

Glossary

hard chromatic	σκληρὸς χρωματικός
heirmologic	εἰρμολογικός
high Nee	ἐπάνω Νη
initial	ἀρχικός
last syllable	λήγουσα
low Di	κάτω Δι
medial	ἀτελής
melody, melodies	μέλος, μέλη
mode	ἦχος
old sticheraric	παλαιὸς στιχηραρικός
phrase	φράσις
plagal	πλάγιος
previous	προηγούμενος
protovarys	πρωτόβαρυς
second to last syllable	παραλήγουσα
second	δεύτερος
section	τμήμα
semi-final	ἡμιτελής
sixth to last syllable	ἕκτη συλλαβὴ ἀπὸ τὸ τέλος
soft chromatic	μαλακὸς χρωματικός
special	ἰδιαίτερος
sticheraric	στιχηραρικός
syllable	συλλαβή
theotokia	θεοτοκία
third to last syllable	προπαραλήγουσα
third	τρίτος
unaccented syllable	ἄτονη συλλαβή
verses	στίχοι

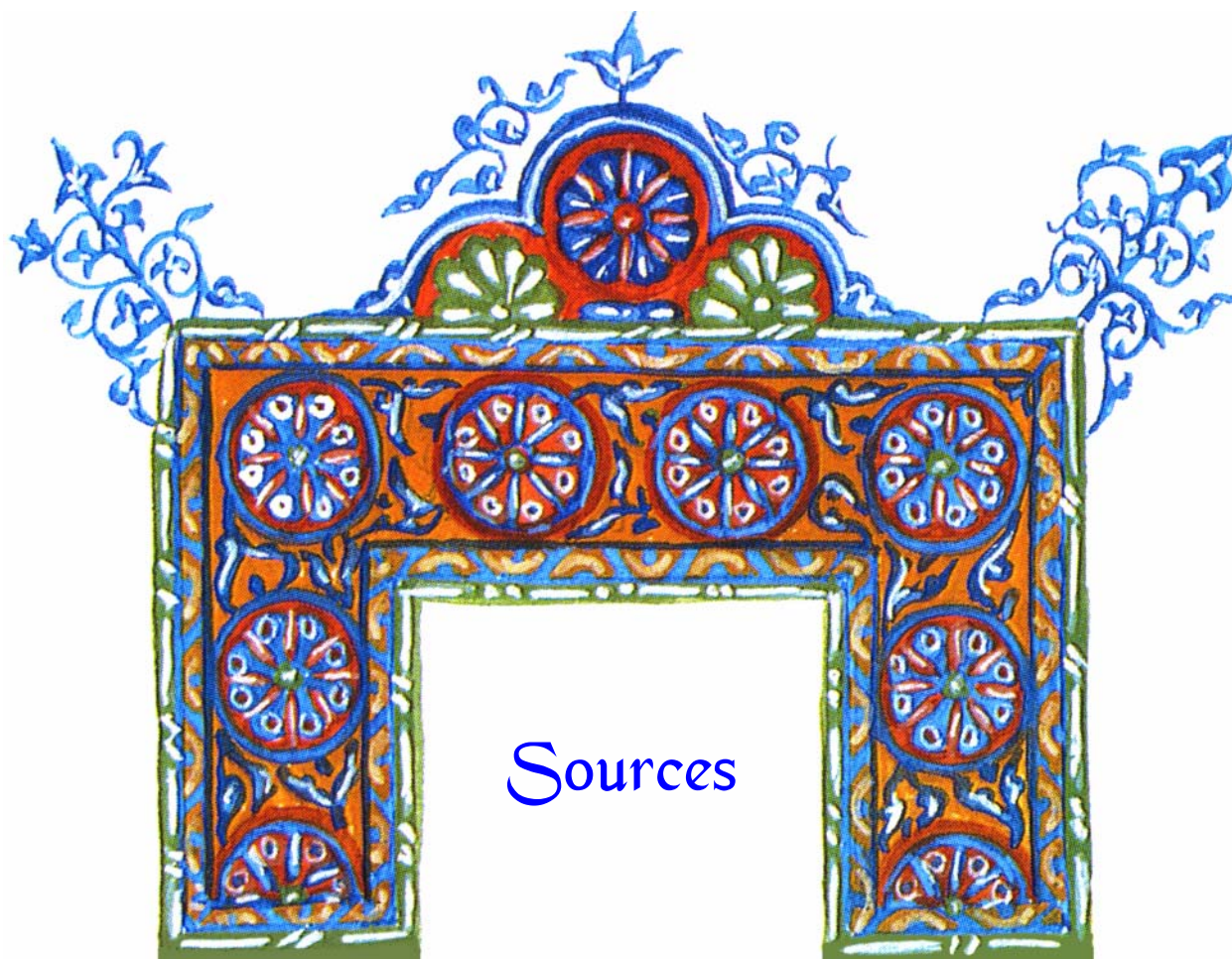
Κλειδί:

1 = τονισμένη συλλαβή

0 = ἄτονη συλλαβή

X = συλλαβή πού εἶναι εἴτε τονισμένη εἴτε ὄχι

Παραλλαγές τῆς ἴδιας θέσεως γράφονται
ἐγχρώμα



The following books were used to collect formulae for these lists:

Ἀθωνιάς, Πέτρου Φιλανθίδου, Ἐκδόσεις «Ὁ Μιχ. Ι. Πολυχρονάκης», Κρήτη
(ἀνατύπωσις τῆς πρώτης ἐκδόσεως ἐν Κωνσταντινουπόλει τῷ 1906).

Ἀναστασιματάριον, Ἰωάννου Πρωτοψάλτου, Ἀδελφότης Θεολόγων ἡ «Ζωή», ἰδ'
ἐκδοσις, Ἀθήναι, 2002.

Ἀναστασιματάριον Νέον, Ζαφείρου Ζαφειροπούλου, Ἀθήνησιν, 1853.

Ἀναστασιματάριον Πέτρου τοῦ Πελοποννησίου, Μουσικὴ Βιβλιοθήκη, Τόμος
Δεύτερος, Ψαλτικὰ Βλατάδων, Πατριαρχικὸν Ἰδρυμα Πατερικῶν Μελετῶν,
Θεσσαλονίκη, 1999 (ἀνατύπωσις τῆς πρώτης ἐκδόσεως τῷ 1869).

Δοξαστάριον, Κωνσταντίνου Πρωτοψάλτου, Ἐκδόσεις «Ὁ Μιχ. Ι. Πολυχρονάκης», Κρήτη (ἀνατύπωσις τῆς ἐν Κωνσταντινούπολει ἐκδόσεως τῷ 1844).

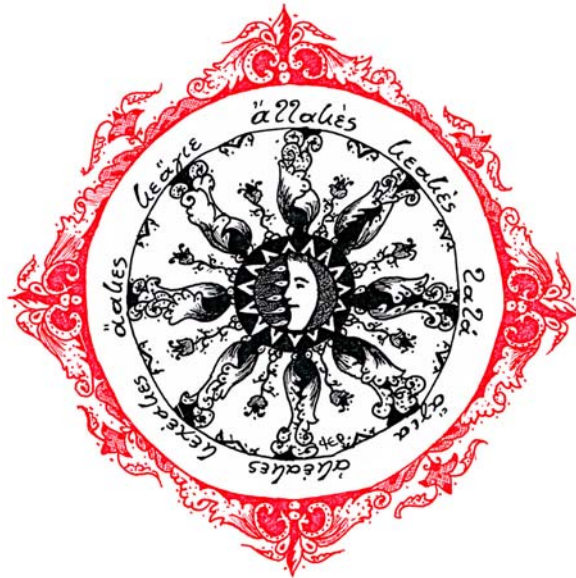
Εἰρμολόγιον Καταβασιῶν, Ἰωάννου Πρωτοψάλτου, Ἐκδοτικὸς Οἶκος Βασ. Ρηγιοπούλου, Θεσσαλονίκη, 1998 (ἀνατύπωσις τῆς ἐν Κωνσταντινούπολει ἐκδόσεως τῷ 1903).

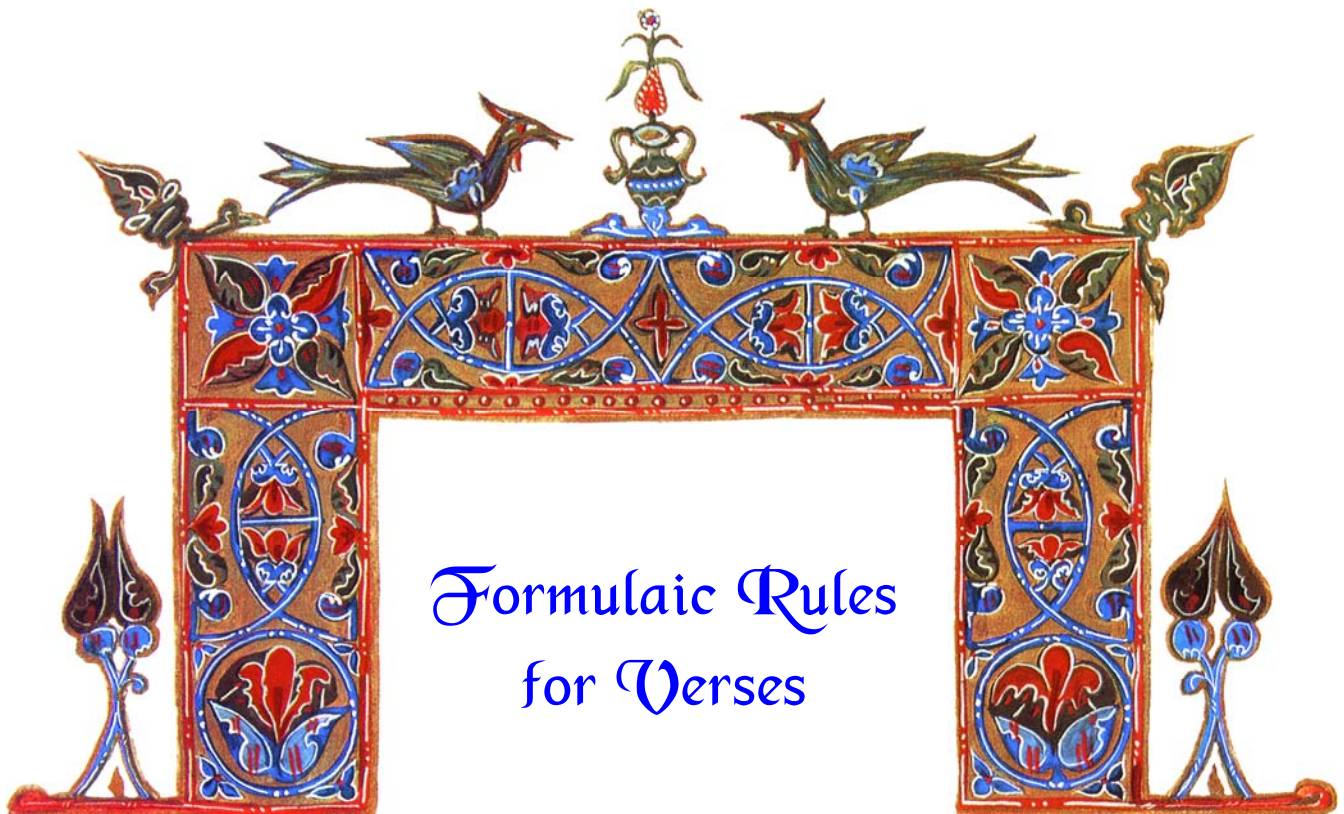
Μουσικὴ Κύψελη, Τόμος Α΄, Β΄ καὶ Γ΄, Στεφάνου Λαμπαδαρίου, Ἐκδόσεις «Ὁ Μιχ. Ι. Πολυχρονάκης», Κρήτη (ἀνατύπωσις τῆς ἐν Κωνσταντινούπολει ἐκδόσεως τῷ 1883).

Μουσικὸν Ἐγκόλπιον Παρακλητικῆς, Τόμος Α΄ καὶ Β΄, Ἱερομονάχου Ἱεροθέου, Ἐκδόσεις Ἱ.Μ. Φιλοθέου, Ἁγιον Ὅρος, 2003.

Νέον Ἀναστασιματάριον, Πέτρου Ἐφεσίου, Ἐκδόσεις Κουλτούρα, 1999 (ἀνατύπωσις τῆς πρώτης ἐκδόσεως ἐν Βουκορεστίῳ τῷ 1820).

Πατριαρχικὴ Μουσικὴ Κιβωτός - Ἑσπερινός, Ἱερομονάχου Ἱεροθέου, Ἐκδόσεις Ἱ.Μ. Φιλοθέου, Ἁγιον Ὅρος, 2002.





Formulaic Rules for Verses

ALTHOUGH the melodies for the verses preceding troparia do more or less follow the standard formulaic rules for troparia, their structure has several nuances that make setting them to music a non-trivial challenge. One such nuance is how verses usually begin quickly and then slow down at a certain point. Rather than try to define all such nuances, we have merely organized the verses so that a composer can quickly find one he can refer to as an example.

The list on the following page shows where to find music for the verses. The entries have been sorted by the binary code of the ending of each verse into four sections:

- 1) Accented on the last syllable
- 2) Accented on the second-to-last syllable
- 3) Accented on the third-to-last syllable
- 4) Accented on the fourth-to-last syllable

Organizing verses in this manner is very helpful to composers because it allows them simply to copy the music for a verse from a traditional, reputable source rather than try to "reinvent the wheel."

Formulaic Rules for Verses

For example, if a composer would like to set to music the verse "To do among them the judgment that is written. This glory shall be to all His saints," he would examine the final words of this phrase and observe that the accentuation pattern is: 010000101. In the chart on the following page, there is an entry with essentially the same binary code: "Ενεκεν τοῦ ὀνόματός σου 1000010000100 (The fact that this Greek verse ends with a 1 instead of a 0 is insignificant for most formulae accented on the third-to-last syllable.) Now, all he needs to do is to find a Byzantine music book in Greek that has the music for this verse. Since the color code is red, one will find this verse in the Stichera of Vespers. The chart on page 978 (which follows the same color code as the lists on page 977) indicates which books have music for the verses of the Stichera of Vespers. The composer then simply finds that verse in one of those books, replaces the Greek words in it with the words of the verse he is trying to set to music, and invents a trivial melody for the verse's initial words. If he were to use the *Anastasimatarion* of Petros Ephesios as a model, the melody he composes might look something like this for sticheraric first mode:

Ⲭ π_q To do a - mong them the judg - ment that is writ - ten. π_q Ⲭ This

| — — — — — | — — — — — Ⲭ π_q Ⲭ π_q Ⲭ π_q Ⲭ π_q Ⲭ π_q

glo - ry shall be to all His saints.

Binary Codes for the End of Verses

Syllable Accented:	Sticheraric Only		Sticheraric and Heirmologic		Syllable Accented:
Last Syllable Λήγουσα	Αἰνεῖτε τὸν Κύριον πάντα τὰ ἔθνη	001000110001	Αἰνεῖτε τὸν Κύριον πάντα τὰ ἔθνη	001000110001	Last Syllable Λήγουσα
	Αἰνεῖτε τὸν Θεὸν ἐν τοῖς Ἁγίοις	1000010001	Καθεῖλε δυνάστας ἀπὸ θρόνων	00100010001	
	Τῷ οἴκῳ σου πρέπει ἁγίασμα	100001	Αἰνεῖτε τὸν Θεὸν ἐν τοῖς Ἁγίοις	1000010001	
Second to Last Παραλήγουσα	Αἰνεῖτε αὐτὸν ἐν τυμπάνῳ	10010010	Τῷ οἴκῳ σου πρέπει ἁγίασμα	100001	Second to Last Παραλήγουσα
	Ἀνάστηθι Κύριε ὁ Θεός μου	0100010	Ὅτι ἐπέβλεψεν ἐπὶ τὴν ταπείνωσιν	000100100001	
	Ἐμὲ ὑπομενοῦσι δίκαιοι	10100010	Αἰνεῖτε αὐτὸν ἐν τυμπάνῳ	10010010	
	Ἐκ βαθέων ἐκέκραξά σοι	01000010	Ἀντελάβετο Ἰσραὴλ παιδὸς αὐτοῦ	1001000110010	
	Ὅτι ἐκραταιώθη τὸ ἔλεος	1000010	Ἀνάστηθι Κύριε ὁ Θεός μου	0100010	
Third to Last Προπαραλήγουσα	Δόξα Πατρὶ καὶ Υἱῷ	10010010010100	Ἐμὲ ὑπομενοῦσι δίκαιοι	10100010	Third to Last Προπαραλήγουσα
	Καὶ γὰρ ἐστερέωσε	10100100	Ἐκ βαθέων ἐκέκραξά σοι	01000010	
	Αἰνεῖτε αὐτὸν ἐν κυμβάλοις	100100100	Ὅτι ἐκραταιώθη τὸ ἔλεος	1000010	
	Ἐὰν ἀνομίας παρατηρήσης	10001000101	Ἐλέησον ἡμᾶς, Κύριε, ἐλέησον ἡμᾶς	00100000010	
	Ἀπὸ φυλακῆς πρωΐας	0010001000100	Καὶ ἔστω ἡ λαμπρότης Κυρίου	0010001010100	
	Ἐνεκεν τοῦ ὀνόματός σου	1000010000100	Μεγαλύνει ἡ ψυχὴ μου τὸν Κύριον	00100100	
	Ὅτι παρὰ τῷ Κυρίῳ τὸ ἔλεος	0010000101	Καὶ γὰρ ἐστερέωσε	10100100	
Fourth to Last Προπροπαραλήγουσα	Ὁ Κύριος ἐβασίλευσεν	1000000100	Αἰνεῖτε αὐτὸν ἐν κυμβάλοις	100100100	Fourth to Last Προπροπαραλήγουσα
	Τοῦ ποιῆσαι ἐν αὐτοῖς κρίμα	10001001	Ἐὰν ἀνομίας παρατηρήσης	10001000101	
	Αἰνεῖτε αὐτὸν ἐπὶ ταῖς δυναστείαις	1000001001	Ἀπὸ φυλακῆς πρωΐας	0010001000100	
	Καὶ νῦν καὶ αἰεὶ	000010001001	Ἐνεπλήσθημεν τῷ πρωὶ τοῦ ἐλέους	0010000101	
	Αἰνεῖτε αὐτὸν ἐν ἡφ σάλπιγγος	0101010	Ἐνεκεν τοῦ ὀνόματός σου	1000010000100	
	Ἐξομολογήσομαί σοι Κύριε	10001010	Ὅτι παρὰ τῷ Κυρίῳ τὸ ἔλεος	0010000101	
	Γενηθήτω τὰ ὦτά σου προσέχοντα	0001001010	Ὁ Κύριος ἐβασίλευσεν	1000000100	
	Ἐξάγαγε ἐκ φυλακῆς	100001010	Πρὸς σὲ ἦρα τοὺς ὀφθαλμούς μου	101001001	
			Ἐποίησε κράτος ἐν βραχίονι αὐτοῦ	10001001001	
			Τοῦ ποιῆσαι ἐν αὐτοῖς κρίμα	10001001	
Color Code: Αἶνους Ὅρθρου Praises of Orthros Ἀπόστιχα Ἑσπερινοῦ Aposticha of Vespers Στιχηρὰ Ἑσπερινοῦ Stichera of Vespers Ἀπόστιχα Καθημερινοῦ Ἑσπερινοῦ Aposticha of Weekday Vespers Ἀπόστιχα Καθημερινοῦ Ὅρθρου Aposticha of Weekday Orthros Μεγαλυνάρια τῆς θ' Ὠδῆς Megalynaria of the 9th Ode			Ὅτι ἐποίησέ μοι μεγαλεῖα	100010001001	Fourth to Last Προπροπαραλήγουσα
			Αἰνεῖτε αὐτὸν ἐπὶ ταῖς δυναστείαις	1000001001	
			Αἰνεῖτε αὐτὸν ἐν ἡφ σάλπιγγος	0101010	
			Ἐξομολογήσομαί σοι Κύριε	10001010	
			Γενηθήτω τὰ ὦτά σου προσέχοντα	0001001010	
			Ἐξάγαγε ἐκ φυλακῆς	100001010	

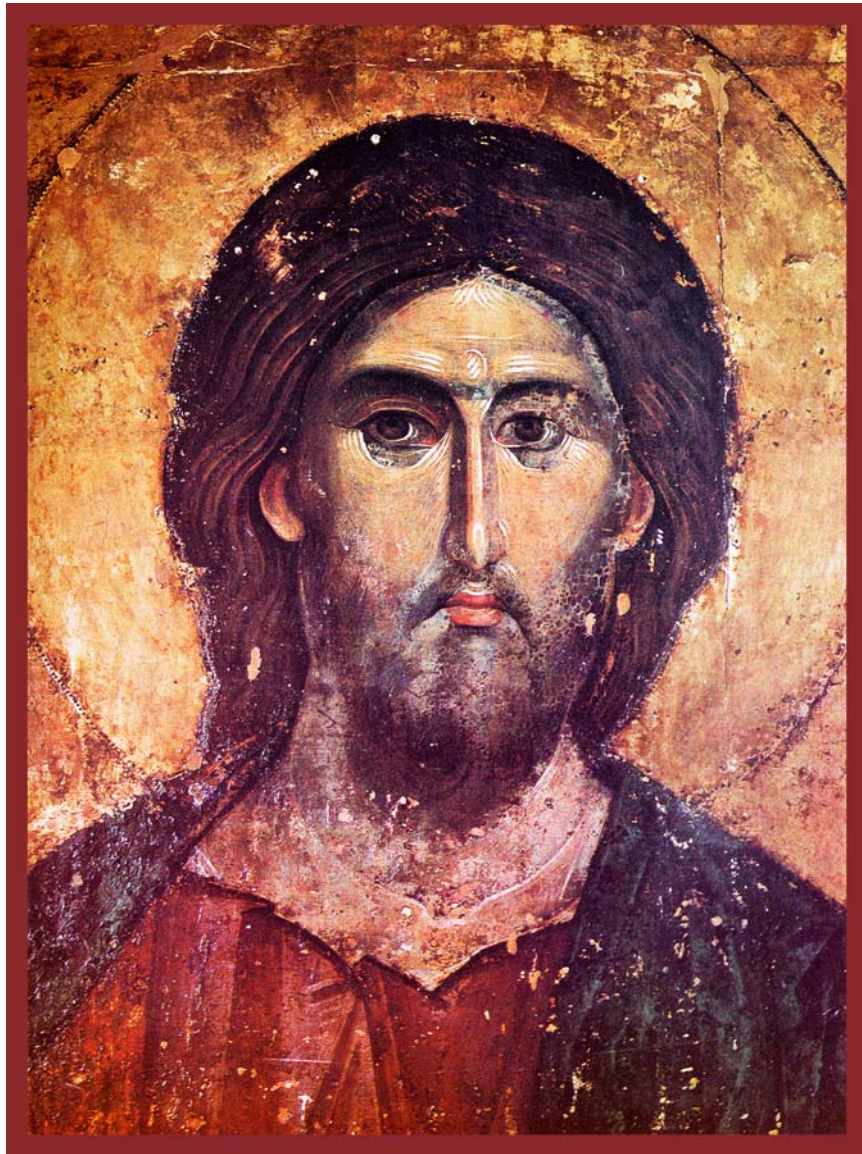
<p><u>Color Shading Code:</u></p> <p>the book has verses in all eight modes τὸ βιβλίο ἔχει στίχους καὶ στοὺς 8 ἤχους</p> <p>the book has verses in only some modes τὸ βιβλίο ἔχει στίχους μόνο σὲ μερικοὺς ἤχους</p> <p>The tiny numbers shaded yellow indicate which modes a particular book has. 1 = first mode, 2 = second mode, 3 = third mode, 4 = fourth mode, 5 = plagal first mode, etc.</p>	Ἀναστασιματάριον Πέτρου Ἐφεσίου	Ἀναστασιματάριον Νέον Ζαφείρου Ζαφειροπούλου	Ἀναστασιματάριον Κωνσταντίνου Πρωτοψάλτου	Ἀναστασιματάριον Πέτρου (Μουσική Βιβλιοθήκη)	Ἀναστασιματάριον Ἰωάννου Πρωτοψάλτου (ἐκδόσεις «Ζωὴς»)	Ἀναστασιματάριον Πέτρου: Ἑσπερινός (Παναγιώτου Πάππα)	Ἀναστασιματάριον Πέτρου: Ὁρθρος (Παναγιώτου Πάππα)	Εἰρμολόγιον Ἰωάννου Τόμος Α΄ (Κωνσταντίνου Μάρκου)	Πατριαρχική Μουσική Κιβωτός Ἑσπερινός (Ιερομ. Τεροθέου)	Μουσικὸν Ἐγκόλπιον Παρακλητικῆς (Ιερομ. Τεροθέου)	Μουσική Παρακλητική π. Κωνσταντίνου Παπαγιάννη	Νέον Ἀναστασιματάριον Ἠλιοπούλου, Παυλάκη
	1820	1853	1865	1869	1933–2002	1998	1998	2002	2002	2003	2004	2006
	Εἰρμολογικά											
	Στιχηρά Ἑσπερινοῦ (Ἐκ βαθέων...)		**									
	Ἀπόστιχα Καθημερινοῦ Ἑσπερινοῦ (Πρὸς σέ ἦρα...)											
	Ἀπόστιχα Ἑσπερινοῦ Σαββάτου (Ὁ Κύριος ἐβασίλευσεν...)	345678	**	3567	345678							
	Αἶνους τοῦ Ὁρθρου (Τοῦ ποιῆσαι ἐν αὐτοῖς...)	3478	**		378							
	Ἀπόστιχα τοῦ Ὁρθρου (Ἐνεπλήσθημεν τῷ πρωΐ...)											
	Μεγαλυνάρια θ΄ ὥδης (Μεγαλύνει ἡ ψυχὴ μου...)			*			1					*
	Στιχηραρικά											
	Στιχηρά Ἑσπερινοῦ (Ἐκ βαθέων...)											
	Ἀπόστιχα Ἑσπερινοῦ Σαββάτου (Ὁ Κύριος ἐβασίλευσεν...)	12		1248	12							
	Αἶνους τοῦ Ὁρθρου (Τοῦ ποιῆσαι ἐν αὐτοῖς...)	1256			12456							
	Μεγαλυνάρια θ΄ ὥδης (Μεγαλύνει ἡ ψυχὴ μου...)			*								

* Has only the first verse of the 9th Ode

*Ἐχει μόνο τὸν πρῶτο στίχο τοῦ θ΄ ὥδης

** Has verses only in "Protovarys" (Pentaphonos Grave Mode)

**Ἐχει στίχους μόνο γιὰ «πρωτόβαρυς» (ἤχος βαρὺς πεντάφωνος)



Glory be to God
for all things